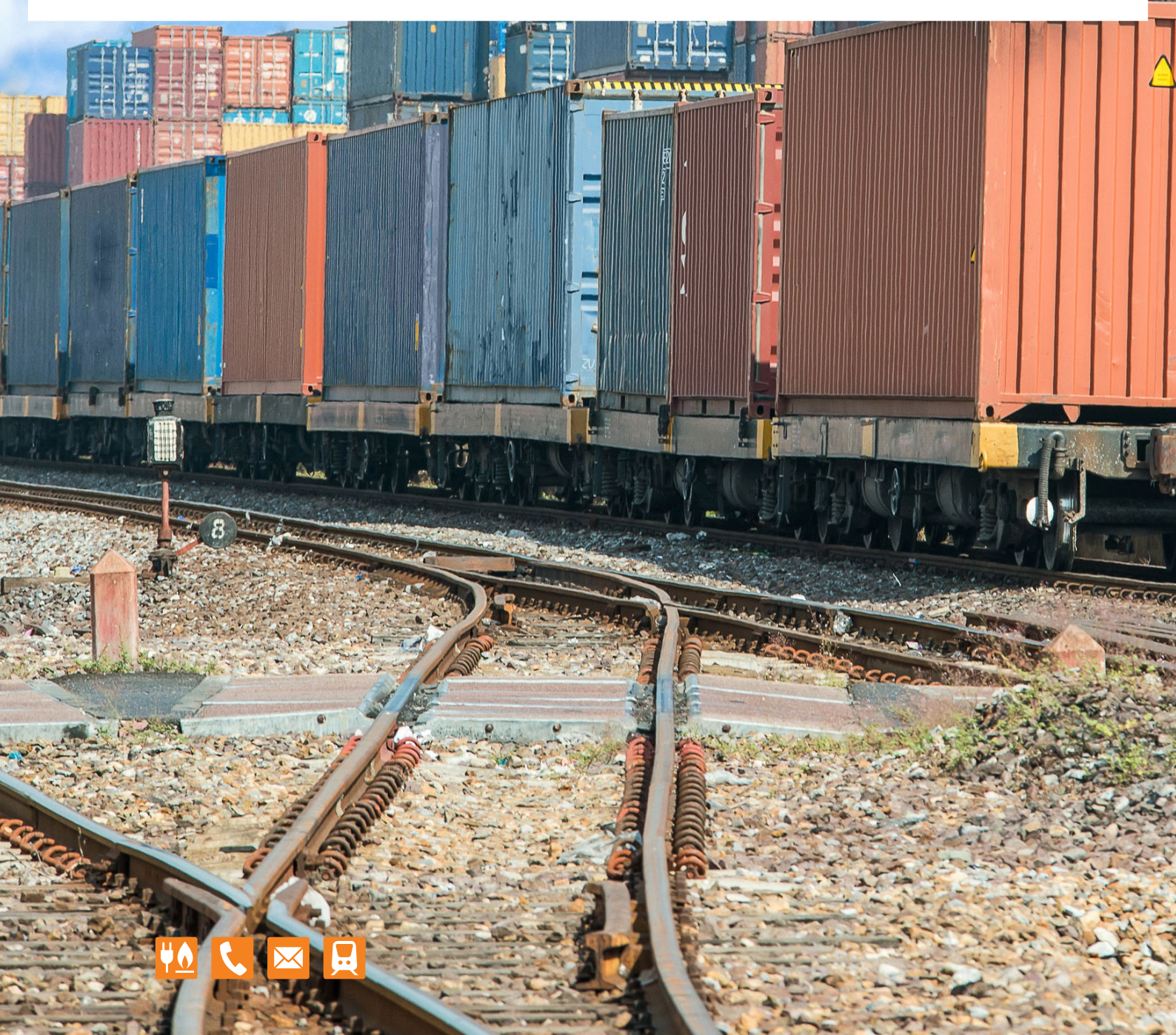
Bundesnetzagentur

Railway Market Analysis

Germany 2019



Railway Market Analysis 2019

Germany

December 2019

Bundesnetzagentur für Elektrizität, Gas,
Telekommunikation, Post und Eisenbahnen

Section 702 – Rail Regulation Economic Policy, Market Watch, Statistics

Tulpenfeld 4
53113 Bonn
Tel.: +49 228 14-0
Fax: +49 228 14-8872
E-mail: info@bnetza.de

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The railway market in figures in 2018

Revenue – Railway undertakings			Δ 17/18
2018	Total	€21.3bn	↑
	Rail freight	€5.7bn	↑
	Long-distance passenger	€4.5bn	↑
	Short-distance passenger	€11.1bn	↑

Revenue – Infrastructure managers			Δ 17/18
2018	Total	€6.6bn	↑
	Track access charges	€5.3bn	↑
	Station charges	€0.9bn	→
	Other charges	€0.4bn	→

Rail traffic			Δ 17/18
2018	Rail freight	132bn tkm	↑
	Long-distance passenger	43bn pkm	↑
	Short-distance passenger	57bn pkm	→

Competitor's share in rail traffic			Δ 17/18
2018	Rail freight	51 percent	↑
	Long-distance passenger	1 percent	↑
	Short-distance passenger	26 percent	↓

Employment – Infrastructure managers and railway undertakings			Δ 17/18
2018	Total	163,000 employees	↑
	Infrastructure managers	76,000 employees	↑
	Railway undertakings, other employees	57,000 employees	↑
	Railway undertakings, only engine drivers	30,000 employees	↑

INTRODUCTION

Background to the market analysis

The Bundesnetzagentur works to ensure effective competition in the railway market. To accomplish this, it needs up-to-date, reliable information about the railway market and the railway undertakings operating in it. For this reason, the Bundesnetzagentur gathers information each year and publishes its findings in its Railway Market Analysis.

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Introduction

By conducting a market survey and reporting on the market in its Railway Market Analysis, the Bundesnetzagentur helps uncover possible discrimination and, by doing so, strengthens competition.

The Bundesnetzagentur's mandate in the railway sector

In its efforts to ensure effective competition in the railway sector, the Bundesnetzagentur monitors compliance with the legal provisions pertaining to non-discriminatory access to railway infrastructure (infrastructure and service facilities) and the charging of reasonable, transparent and non-discriminatory prices.

The Bundesnetzagentur's specific duties and powers are set forth in the Railway Regulation Act (ERegG) and the General Railway Act (AEG).

Background to the market analysis

To be able to fulfil these tasks, the Bundesnetzagentur needs valid, up-to-date information about the railway market in general and railway undertakings in particular.

For this reason, it has conducted annual written surveys to collect market data since it took up its work in 2006. In March or April of every year, it sends questionnaires to railway undertakings and other parties with access entitlements, such as regional transport authorities. For the 2018 reporting year, the Bundesnetzagentur sent its questionnaire to approximately 1,000 market participants.

The scope of the Bundesnetzagentur's market monitoring activities is defined in Section 17 of the Railway Regulation Act.

This act contains provisions requiring market participants to provide information to the Bundesnetzagentur. Besides the obligation to make available information that is needed for statistical and market monitoring purposes, market participants are also required to provide information on their financial situation.

The obligation to supply information to the Bundesnetzagentur applies to all market participants. "Market participants" also include factory railways, heritage railways and non-standard-gauge railways. The Railway Regulation Act does not allow exemptions from the requirement to participate in the annual market survey. In the event of non-compliance with this requirement, the Bundesnetzagentur can, under Section 67 (4) in conjunction with Section 67 (1) of the Railway Regulation Act, impose a penalty of up to €500,000.

The results of the survey are published not only in the "Railway Market Analysis" as required by Section 122 of the Telecommunications Act but also in the Bundesnetzagentur's "Annual Report" and in its "Activity Report - Railways" (Section 71 of the Railway Regulation Act). The focus of the latter two publications is on regulatory aspects of the market, while the "Railway Market Analysis" publishes current statistical data, enabling interested parties to gain insights into the railway sector's structure and performance.

In addition, the Bundesnetzagentur examines, pursuant to Section 65 ff. of the Railway Regulation Act, the extent to which the market has been liberalised and the amount of competition in the markets for maintenance facilities. Market participants had until 30 November 2019 to submit their comments on

the draft report. The Bundesnetzagentur expects to publish this report in 2020.

In 2019, the Bundesnetzagentur prepared in conformity with Section 37 of the Railway Regulation Act a cost recovery report for the first time regarding the structure of the charges for the use of railway infrastructure and passenger stations in connection with passenger transport services provided as part of a public service contract. This report was published on the website of the Bundesnetzagentur in October 2019.

The Bundesnetzagentur strives to ensure continuity in its collection and analysis of data. This continuity gives the surveyed enterprises and parties with access entitlements a sound basis for planning. In addition, it is the only way that useful time series can be generated.

In July 2015, the European Commission issued Implementing Regulation (EU) 2015/1100. This Regulation requires Member States to provide the European Commission specific information regarding the development of the railway markets. This is done in connection with the Rail Market Monitoring Scheme (RMMS).

The market participants were asked a number of new questions for the 2018 reporting year, including the volume of services provided and the amount of revenue generated, broken down by production concept and market segment. Further questions pertained to details of refunds of track access charges in the rail freight transport segment due to the resolution passed by the federal government in 2018 on track access charge assistance for rail freight transport services.

Market definition

The Railway Market Analysis 2019 examines the area of transport that uses railway infrastructure. Railway infrastructure itself is also a focus of the analysis.

Depending on the type of infrastructure they operate, companies are referred to as railway infrastructure operators or service facility operators. For the market survey, service facilities are further broken down into refuelling facilities, passenger stations, freight yards and freight terminals, marshalling yards, train formation facilities, storage sidings, maintenance facilities and ports.

Unless otherwise indicated, the figures in the following text and diagrams refer to the 2018 reporting year.

An assessment of infrastructure managers' services and charges was carried out as part of the market survey conducted in 2019.

Data from other sources (including Germany's Federal Statistical Office, Federal Office for Goods Transport, the Federal Railway Authority and Deutsche Bahn AG) were also used for the publication "Railway Market Analysis 2019".

Figure 1 provides an overview of the definition of the market used in the Railway Market Analysis. It should be noted that rolling stock manufacturers and railway undertakings, for instance, may also be rail infrastructure managers as a sub-function of their primary business.

Data from a total of 330 railway undertakings operating in the market was used in the analyses. One hundred and twenty-five of these railway undertakings provided services in the short-distance passenger rail transport segment. Another 35 provided services in the long-distance passenger rail transport segment and 176 in the rail freight transport segment. In addition, data from 136 railway line infrastructure operators and 575 service facility

operators was taken into account for the market analysis. Furthermore, 30 regional transport authorities submitted data for the 2018 reporting year to the Bundesnetzagentur.

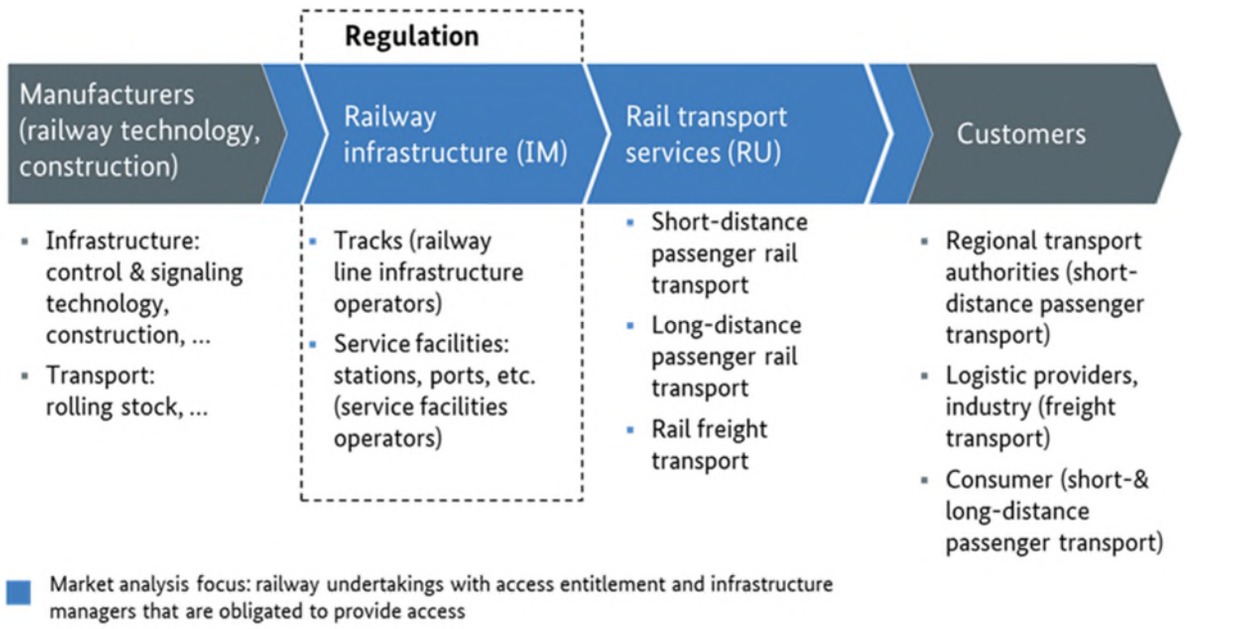
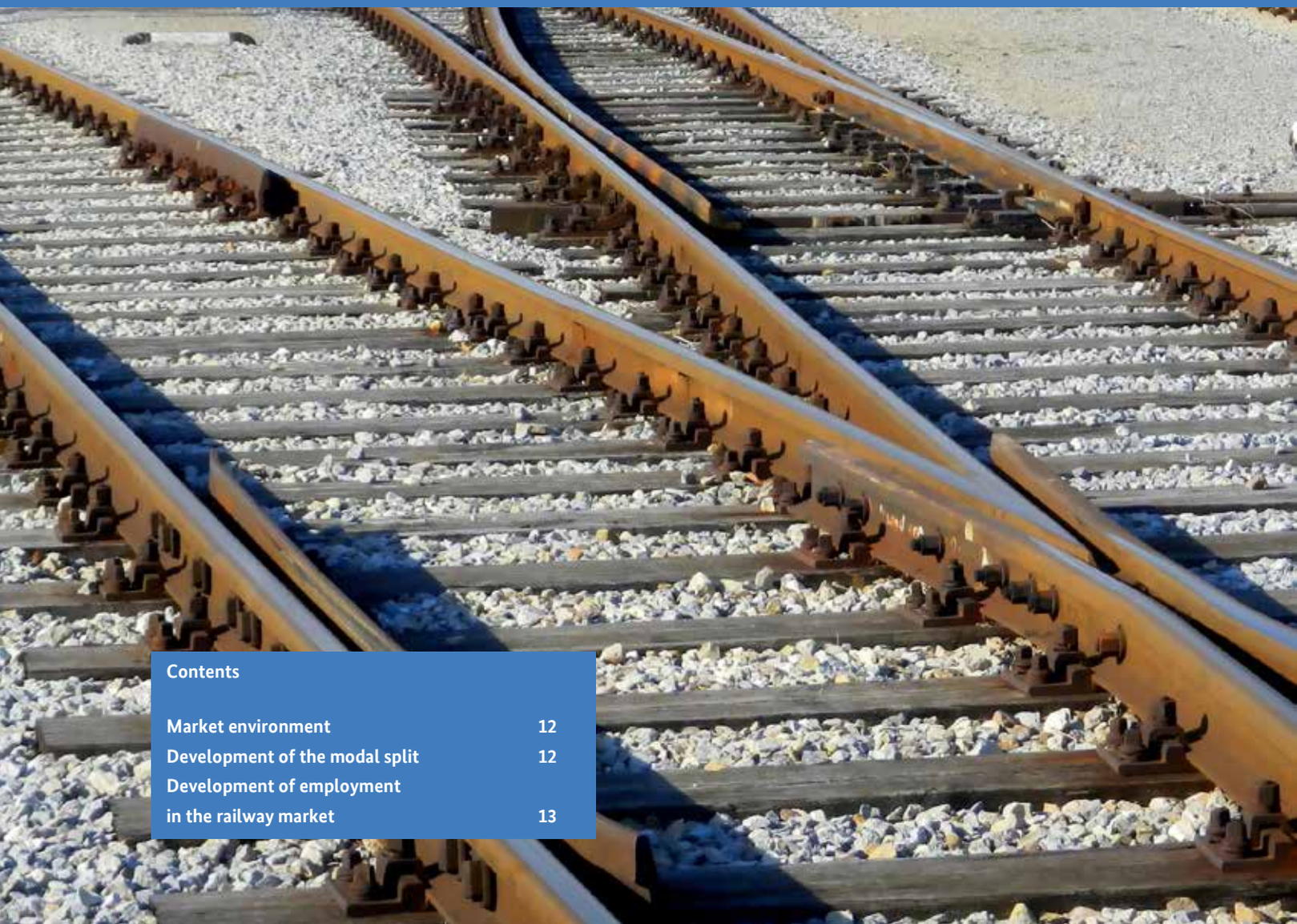


Figure 1: Market definition used in the Railway Market Analysis

RAILWAY MARKET

Economic environment

Besides looking at companies in the railway market, the Bundesnetzagentur also examines how the economic environment is developing. This allows it to observe and assess company-specific and railway-specific developments in a broader context.



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Railway market overview

The rail transport segment's shares of Germany's overall transport volume are subject to small fluctuations and have grown slightly in recent years.

Market environment

The positive development that the German economy has seen since the crisis in 2009 continued through the year 2018. Compared to 2017, Germany's real gross domestic product has grown by 1.5 percent. After having grown steadily since 2016, GDP declined by one percent in 2018.

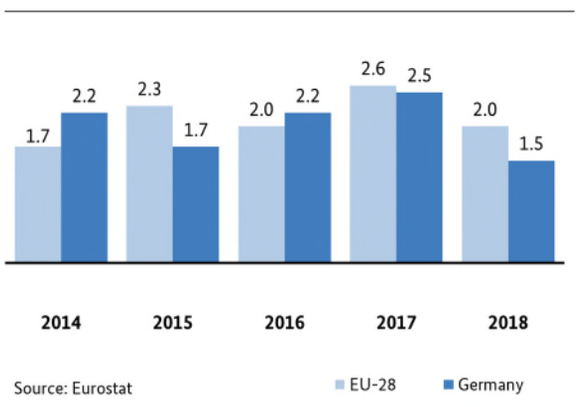


Figure 2: Development of GDP in real terms (2014-2018; year-on-year increase in percent)

The European Union's 28 Member States (EU-28) saw a somewhat different development in the past years. Economic growth increased noticeably starting 2015 and peaked at 2.6 percent in 2017. However, the growth rate fell again in 2018 by 0.6 percentage points to 2.0 percent.

Development of the modal split

The share of road freight transport increased by 1.2 percentage points over the previous year, while the share held by inland waterway transport fell by 1.4 percentage points to 6.8 percent. The share held by inland waterway transport has steadily declined since 2014, and since 2018 has been at its lowest level since 2014.

Based on information regarding rail transport services taken from the Bundesnetzagentur's railway market surveys, rail freight transport's share of the modal split increased steadily through 2016. It then decreased slightly by 0.2 percentage points between 2016 and 2017. This was followed by a small increase of 0.2 percentage points between 2017 and 2018.

Part of the gains seen up to 2016 was due to the fact that the surveys are penetrating more deeply into the market, particularly in the case of railway undertakings whose registered offices are located in other European countries.

This explains the need for a robust legal basis that ensures valid statistical results.

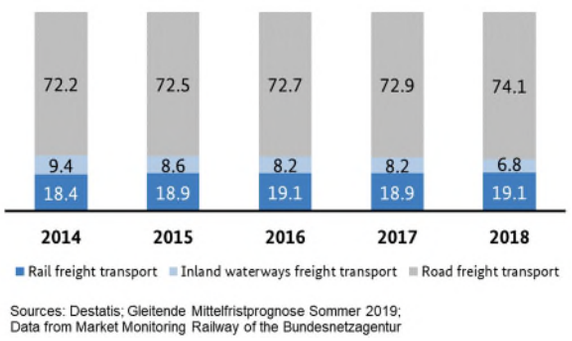


Figure 3: Development of the modal split in the freight transport segment (2014-2018; shares in percent)

The market shares held by the individual modes in the passenger transport segment out of the total volume of transport services remained largely stable over the previous year. At 8.8 percent, the share held by the passenger rail transport segment was slightly higher than the figure reported in recent years.

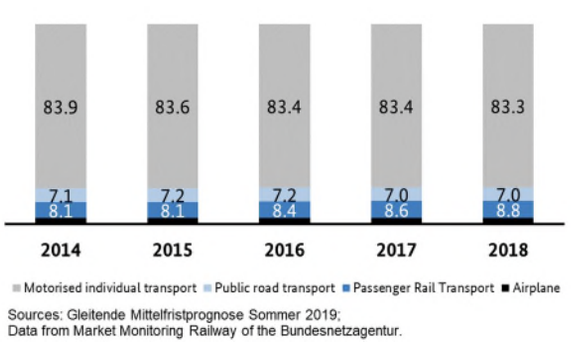


Figure 4: Development of the modal split in the passenger transport segment (2014-2018; shares in percent)

Development of employment in the railway market

After having steadily fallen until the year 2010, the number of workers employed in the railway sector (measured in terms of full-time equivalents[1]) has been on the rise since 2014. The year 2018 saw a marked increase in employment, particularly at infrastructure managers and in the number of other staff at railway undertakings. All in all, approximately 163,000 full-time positions were filled in the railway market.

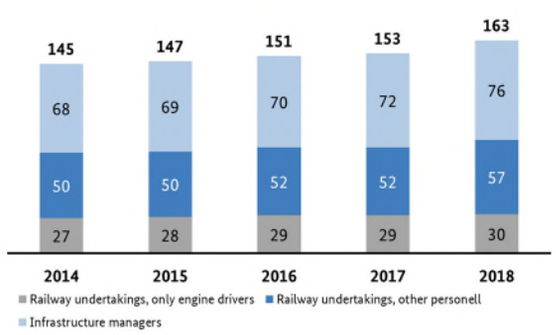


Figure 5: Development of employment in the railway market (2014-2018; full-time equivalents in thousands)

Availability of personnel

As part of the market survey, railway undertakings have the opportunity to rate the availability of personnel, using a scale from 1 (“good availability”) to 5 (“places company’s existence at risk”) for the areas: train drivers, technical operational railway personnel and other personnel.

The surveyed railway undertakings and infrastructure managers rated the availability of

[1] Part-time positions are calculated as partial full-time positions, based on the number of working hours.

personnel slightly worse than in the previous year.

Fewer than one-third of the surveyed railway undertakings rated the availability of technical operational railway personnel as good. The situation is particularly problematic in the case of train drivers. Here, 59 percent of the undertakings are dealing with a strained situation. At the same time, some 42 percent of the participating railway undertakings rated the availability of other personnel as good. The ratings for both "other personnel" and "technical operational railway personnel" have worsened by 0.1 percentage points since 2016. The assessment of the availability of train drivers was even worse.

The infrastructure managers surveyed were more critical than last year in their assessment of the availability of operational personnel, giving an average rating of 3.1. This is 0.2 percentage points worse than in 2016. In general, the availability of "other personnel" was rated better. Half of the surveyed infrastructure managers gave good ratings for the availability of other personnel. However, the average rating assigned this category has worsened by 0.2 percentage points since 2016.

The railway undertakings are currently in a phase in which they are adding personnel. In addition, they are seeing greater outflows due to the age structure of their workforces (demographics). Together, these two factors are clearly leading to a shortage of skilled labour which railway undertakings are having to counter by conducting training programmes of their own.

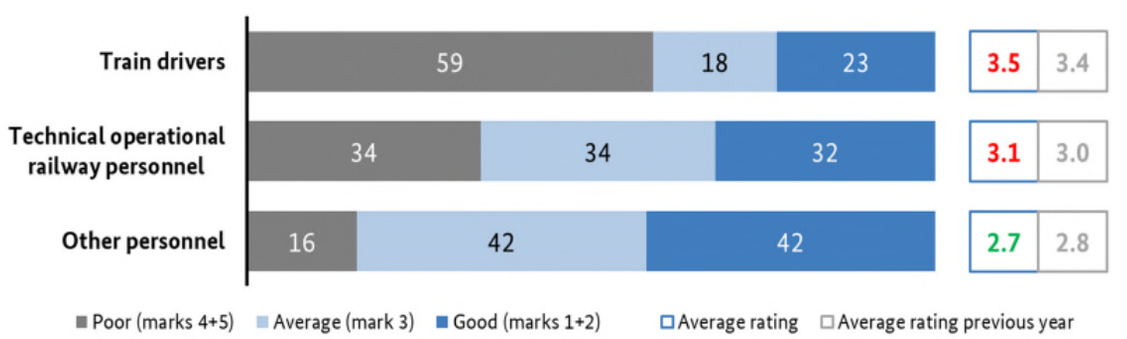


Figure 6: Availability of personnel for railway undertakings (2019; rating shares in percent and average marks)

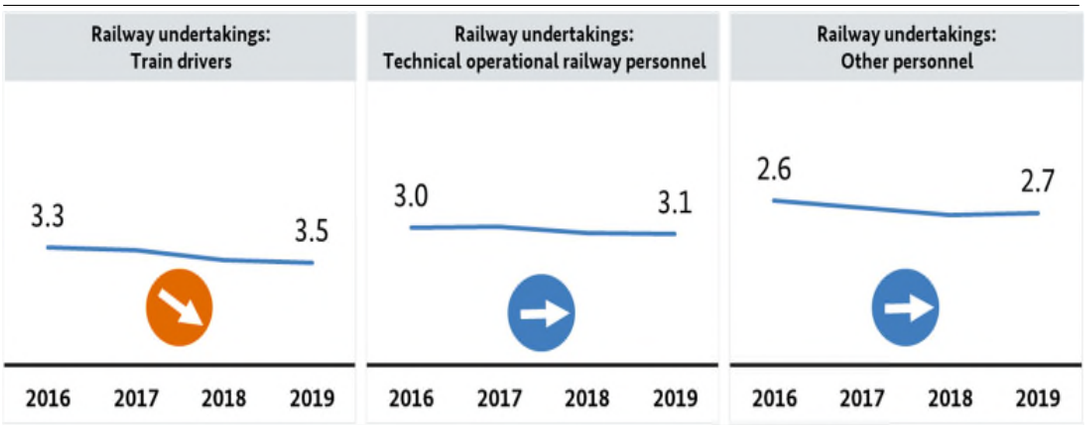


Figure 7: Development of ratings regarding the availability of personnel for railway undertakings (2016-2019)

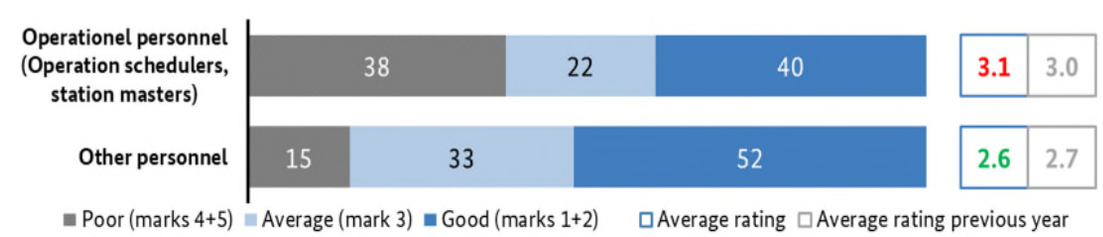


Figure 8: Availability of personnel for infrastructure managers (2019; rating shares in percent and average marks)

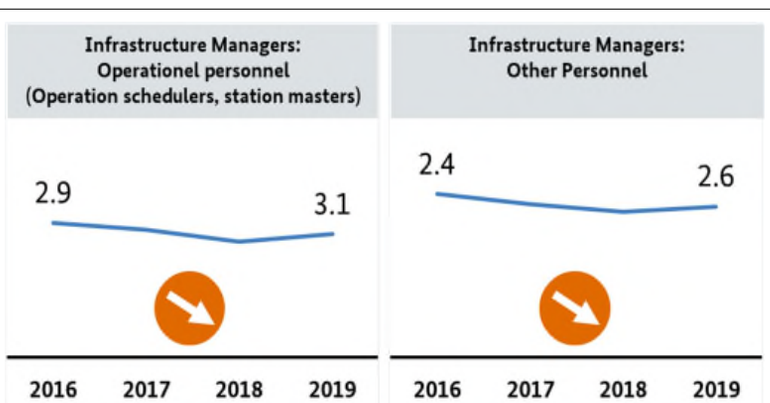
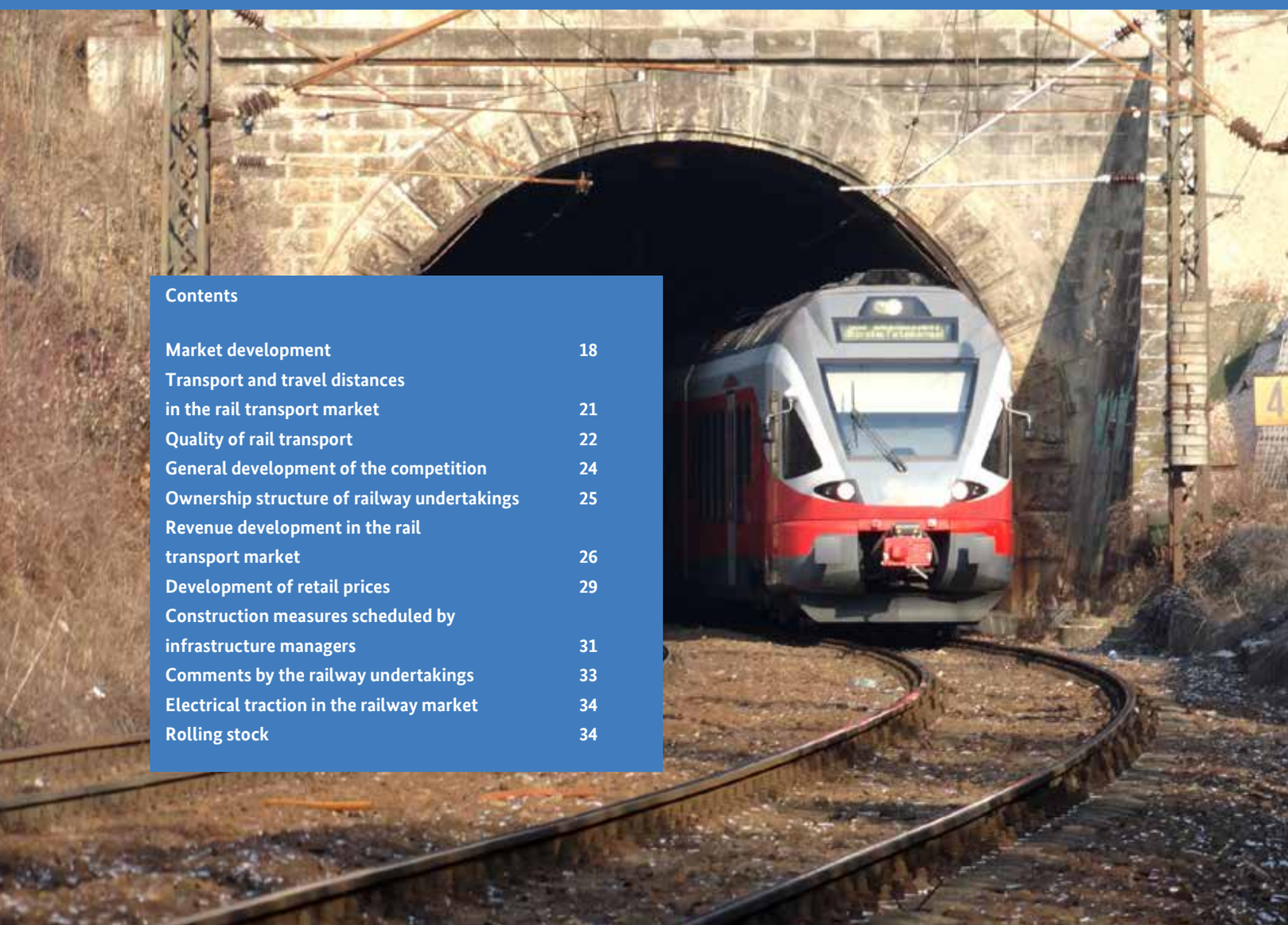


Figure 9: Development of ratings regarding the availability of personnel for infrastructure managers (2016-2019)

Rail transport

The railway market is divided into the transport market and the infrastructure market. Railway undertakings provide rail transport services.

The Bundesnetzagentur monitors railway undertakings. Based on this information, it determines how well the railway market is functioning and how efficient it is.



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Rail transport market

The number of active undertakings in the rail transport market remained constant. The revenue generated in this market has increased moderately from year to year. The volume of transport services provided in 2018 increased.

Market development

Under Section 3(1), No. 1 of the General Railway Act, a public railway undertaking is a railway undertaking that is run on a commercial basis and may be used by anyone to convey persons or goods. The Federal Railway Authority's register of public railway undertakings indicates that their number increased through the year 2014 and then remained stable from 2015 to 2018. As of October 2019, 452 railway undertakings were licensed to provide rail transport services for the public.

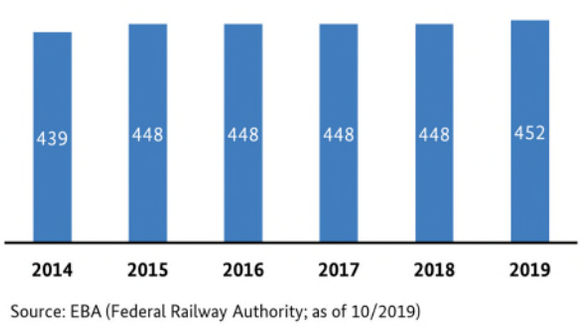


Figure 10: Licensed public railway undertakings (2014-2019; number of railway undertakings in Germany)

According to the Bundesnetzagentur's annual survey, more than 300 railway undertakings were active in providing railway services in Germany. Compared to other countries, the German railway market counts among those national railway markets with the largest number of competitors.

A total of 176 railway undertakings provided commercial rail freight transport services. 125 railway undertakings provided short-distance passenger rail transport.

The number of railway undertakings operating in the long-distance passenger rail transport segment remained comparatively small. Approximately 35 – mostly smaller – railway undertakings provided transport services in this segment. The vast majority of these railway undertakings focuses exclusively on providing special non-scheduled rail services and consequently does not compete with regular (interval) services.

A number of railway undertakings provide transport services in both the passenger rail transport segment and the rail freight segment.

The growth seen in the aggregate revenues in the railway market in recent years continued through the reporting period. Revenue growth from 2017 to 2018 totalled more than three percent. In all, railway undertakings generated €21.3 billion in revenue in 2018. Revenue in the rail freight transport segment increased from €5.6 billion to €5.7 billion. Revenue in the short-distance passenger rail transport segment increased from €10.8 billion to €11.1 billion. Revenue in the long-distance passenger rail transport segment rose from €4.2 billion to €4.5 billion, somewhat more than in the previous year.

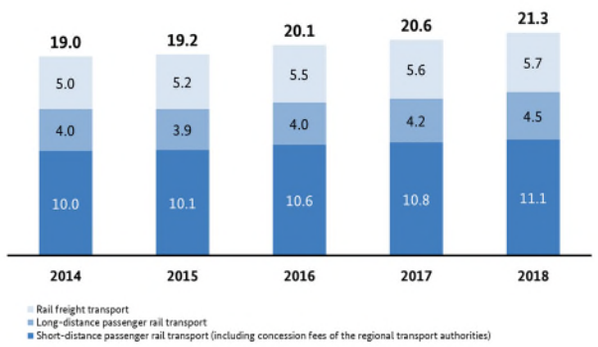


Figure 11: Revenues in the railway market (2014-2018; billions of euros)

Transport volume in the passenger rail transport segment rose to a new high in 2018.

The short-distance passenger rail transport segment transported more than 2.76 billion passengers, a renewed increase in 2018. The increase was however minimal.

Approximately 148 million passengers were transported in the long-distance passenger rail transport segment in 2018. This represents an increase of approximately three percent over the previous year.

A total of 413 million tonnes of freight were transported in the rail freight segment, slightly more than in the previous year.

In contrast to transport volume (freight volumes or number of passengers), transport performance additionally takes average transport or travel distances into account.

Transport performance in the short-distance passenger rail transport segment remained constant at 57 billion passenger-kilometres.

Transport performance in the long-distance passenger rail transport segment improved, increasing from 41 billion to 43 billion passenger-kilometres from 2017 to 2018. This represents an increase of nearly five percent.

According to data from the Bundesnetzagentur, transport performance in the rail freight segment reached 132 billion tonne-kilometres. Transport performance was just 128 billion tonne-kilometres in the previous year. The year-on-year increase was approximately four percent.

In recent years, figures for transport performance and transport volumes in the rail freight transport segment from the Bundesnetzagentur's market analysis have been in some instances significantly higher than those from the Federal Statistical Office.

This was due primarily to the fact that the Bundesnetzagentur determines its market figures on the basis of full surveys. By contrast, the Federal Statistical Office took only a limited reporting population into account in many of its publications, particularly those based on monthly statistics. Since then, the Federal Statistical Office has published updated statistics that are based on an expanded reporting population. The market data published in these updates exhibit some convergence with the data published by the Bundesnetzagentur, although a difference still exists.

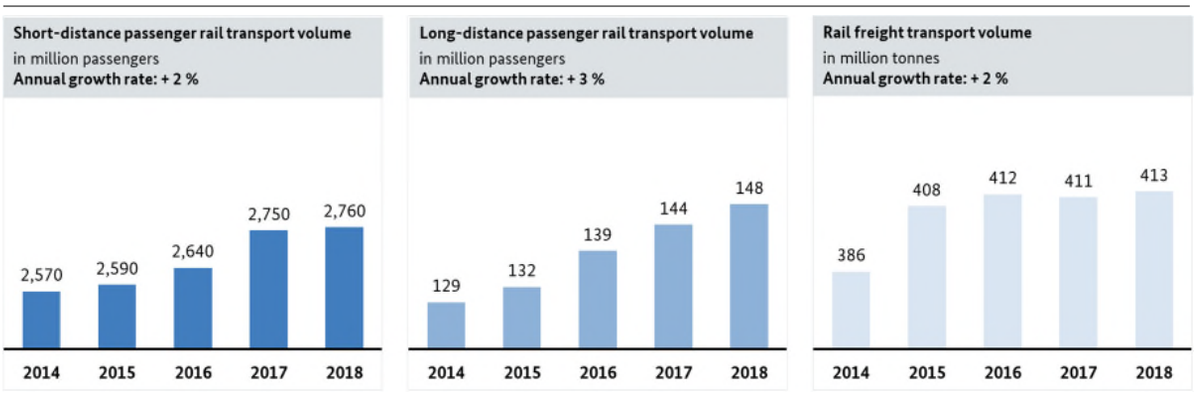


Figure 12: Development of transport volumes, broken down by type of transport service (2014-2018; in millions of passengers/in million tonnes of freight)

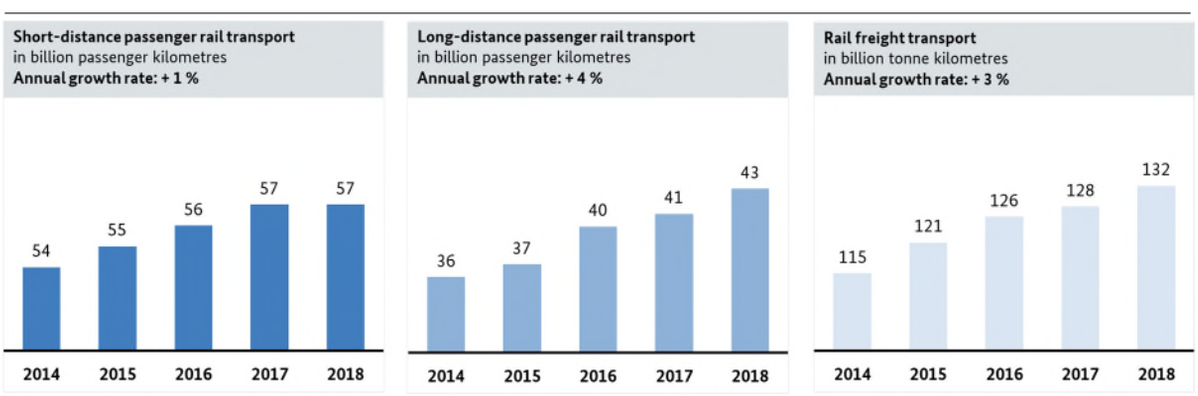


Figure 13: Development of traffic, broken down by type of transport service (2014-2018; in billions of passenger-kilometres/tonne-kilometres)

Transport and travel distances in the rail transport market

The following figure shows the development of the average transport and travel distances calculated on the basis of the respective quotient of transport performance and transport volume.

The average travel distance in the short-distance passenger rail transport segment remained unchanged at 21 kilometres in 2018.

The average travel distance in the long-distance passenger rail transport segment rose from 283 to 290 kilometres, an increase of more than two percent after having remained constant from 2014 to 2015 and then increasing slightly from 2015 to 2016.

The average transport distance in the rail freight segment increased from 313 to 319 kilometres.

When looking at average travel and transport distances, it should be remembered that the Bundesnetzagentur takes only inland transport services into account in its market analysis. Consequently, only those passenger-kilometres, tonne-kilometres and train-kilometres from cross-border services that were provided within Germany's borders are included in the survey data.

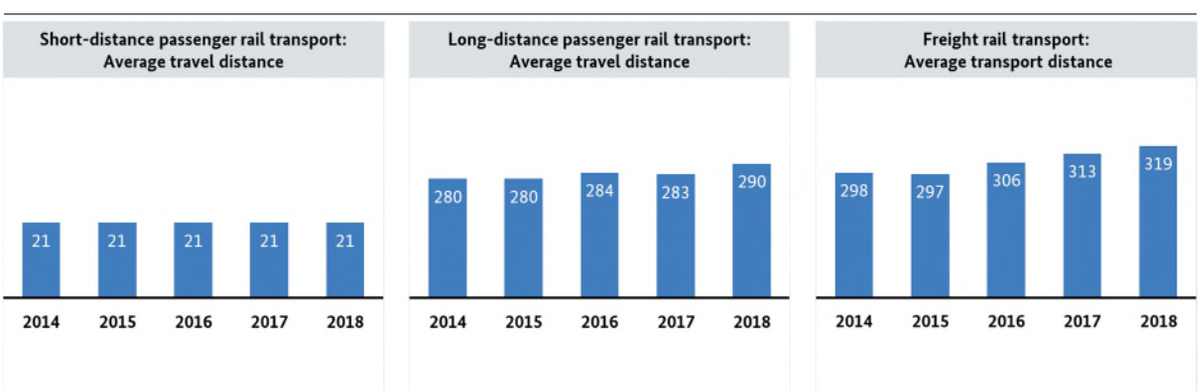


Figure 14: Development of average transport and travel distances (2014-2018; in kilometres)

Quality of rail transport

Punctuality

A passenger train is considered to be delayed when it runs five or more minutes behind schedule. A freight train is considered to be delayed when it runs 15 or more minutes behind schedule.[2]

Infrastructure managers have the opportunity, as part of the Bundesnetzagentur's annual market survey, to provide statistics regarding train punctuality. In this connection, the Bundesnetzagentur asks for data on the number of: scheduled trains that actually ran, delayed trains, trains cancelled on legs of routes, and trains that were cancelled completely.

The share of delayed trains, trains that were cancelled on legs of routes, and trains that were cancelled completely in the short-distance passenger rail transport segment in the DB Netz AG's railway network was around 12 percent during the 2018 reporting year.

Approximately 71 percent of the trains in the long-distance passenger rail transport segment were punctual during the 2018 reporting year.

The share of delayed trains, trains cancelled on legs of routes, and trains that were cancelled completely represented approximately 38 percent of all trains in operation.

The lower level of punctuality affects the amount of the contractual penalties that railway undertakings have to pay to regional transport authorities and the refunds they pay to passengers.

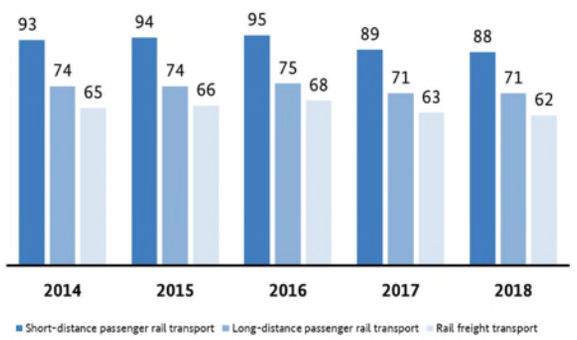


Figure 15: Development of DB Netz AG's punctuality, broken down by type of transport service (2014-2018; shares in percent)

[2] These margins have been laid down as standards in Commission Implementing Regulation (EU) 2015/1100. In Germany however infrastructure managers still apply different margins. For example, the margins used by DB Netz AG are six minutes and 16 minutes respectively.

Starting with the 2017 reporting year, punctual arrivals and departures are reported based on delay margins of five and 15 minutes respectively as laid down by Commission Implementing Regulation (EU) 2015/1100.

Contractual penalties/penalty payments that railway undertakings pay to the regional transport authorities

According to the regional transport authorities, railway undertakings paid approximately €203 million in contractual penalties/penalty payments to the regional transport authorities during the 2018 reporting year. This figure was approximately €163 million during the previous reporting period. This represents an increase of slightly more than 24 percent between 2017 and 2018.

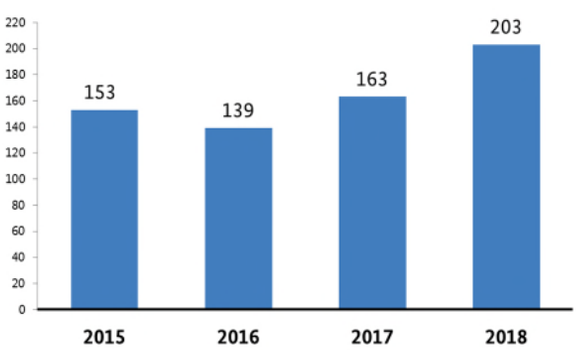


Figure 16: Development of contractual penalties that railway undertakings paid to regional transport authorities (2015-2018; in millions of euros)

Reimbursements made to passengers

Railway undertakings refunded slightly more than €48 million to passengers during the 2018 reporting year in compliance with passenger rights regulations or as a gesture of goodwill. This represents an increase of more than 26 percent compared to 2017.

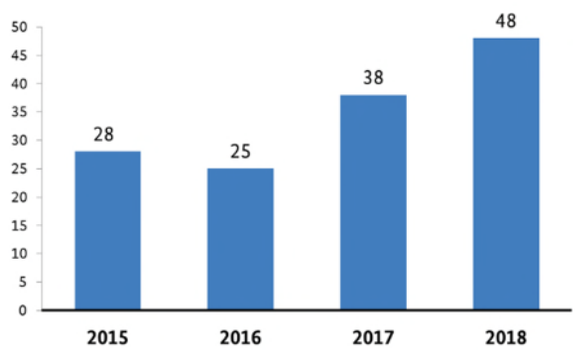


Figure 17: Development of reimbursements (2015-2018; in millions of euros)

General development of the competition

Competition in the rail freight transport segment continued to grow in 2018. The competitors increased their market share to 51 percent of the transport performance in the rail freight transport market.

The picture of the market shares in the passenger rail transport segment held by competitors varied in 2018, depending on the market.

Measured in terms of transport performance, the market share held by competitors in the short-distance passenger rail transport segment was 26 percent in 2018, slightly less than in the previous year. Their share is however expected to increase further in the coming years since several high-volume networks have been awarded to competitors.

Following FlixTrain and ÖBB's (Austrian Federal Railways) entry into the long-distance passenger rail transport market, competitors now account for slightly more than one percent of this segment. FlixTrain and ÖBB served nine routes in 2018. A further expansion is planned. Following DB's exit from the night train service market, ÖBB night trains now connect Germany with Italy, Poland, Austria and Switzerland.

One reason why there is so little competition in this sector is that sizable investments must be made in suitable rolling stock in combination with ensuring safety when accessing and using infrastructure.

For operators, the availability of line capacity on attractive routes that can be used on a medium or long-term basis during suitable time slots is very important for being able to provide economically viable long-distance passenger rail transport service.

Lastly, long-distance passenger rail transport has, on average, the highest track access charges compared to the other modes of transport. This is one reason why long-distance passenger rail transport operates on a deficit basis on certain line sections and why, from an economic standpoint, it frequently cannot be offered for sections where demand is weak.

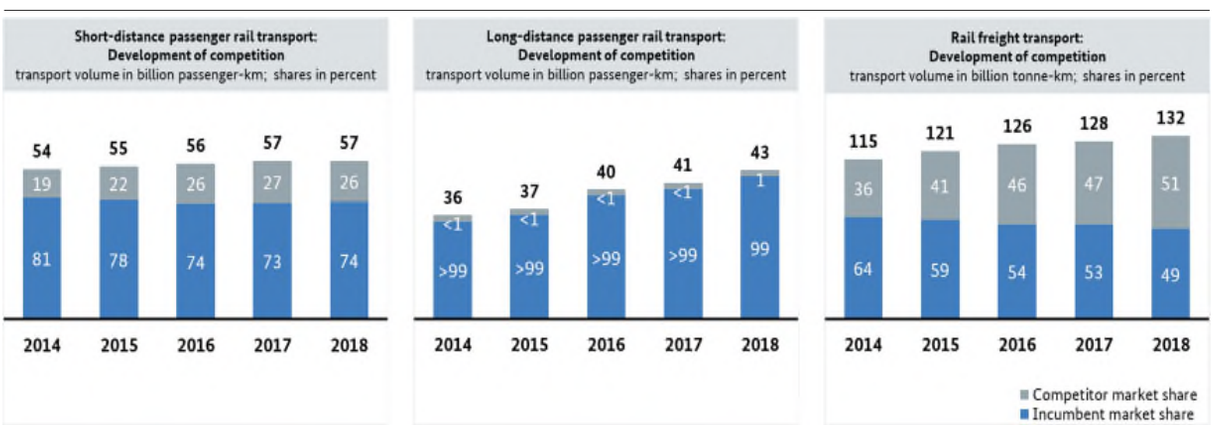


Figure 18: Development of the competition, broken down by type of transport service (2014-2018, traffic handled in billions of passenger-kilometres or tonne-kilometres and shares in percent based on passenger-kilometres/tonne-kilometres)

Ownership structure of railway undertakings

In the wake of the liberalisation of the German railway market which was part of the 1994 Railway Reform, Deutsche Bahn AG (DB AG) railway undertakings have faced ever-growing competition from other railway undertakings in the following years.

Moreover, the German railway market is attractive for foreign railway undertakings as well. In addition to privately run railway undertakings and railway undertakings that are managed under public law, state-owned railways of other European countries operate in the German railway market.

Railway undertakings belonging to Deutsche Bahn AG continue to be the dominant force, measured in terms of the volume of the transport services they provide.

Disregarding federally owned railway undertakings, competition in the short-distance passenger rail transport segment is divided between three groups of owners: Germany's federal states and local authorities (28 percent), privately owned companies (23 percent) and subsidiaries of foreign state-owned railways (49 percent). These figures have changed only slightly over the 2017 reporting year.

In the rail freight transport market, railway undertakings owned by Germany's federal states or local authorities play a less important role, accounting for nine percent of the transport services provided by non-federally owned railways. State-owned railways of other countries provide 37 percent of the total transport services, while privately operated railway undertakings with registered offices in Germany account for 45 percent. Private foreign railway undertakings account for nine percent.

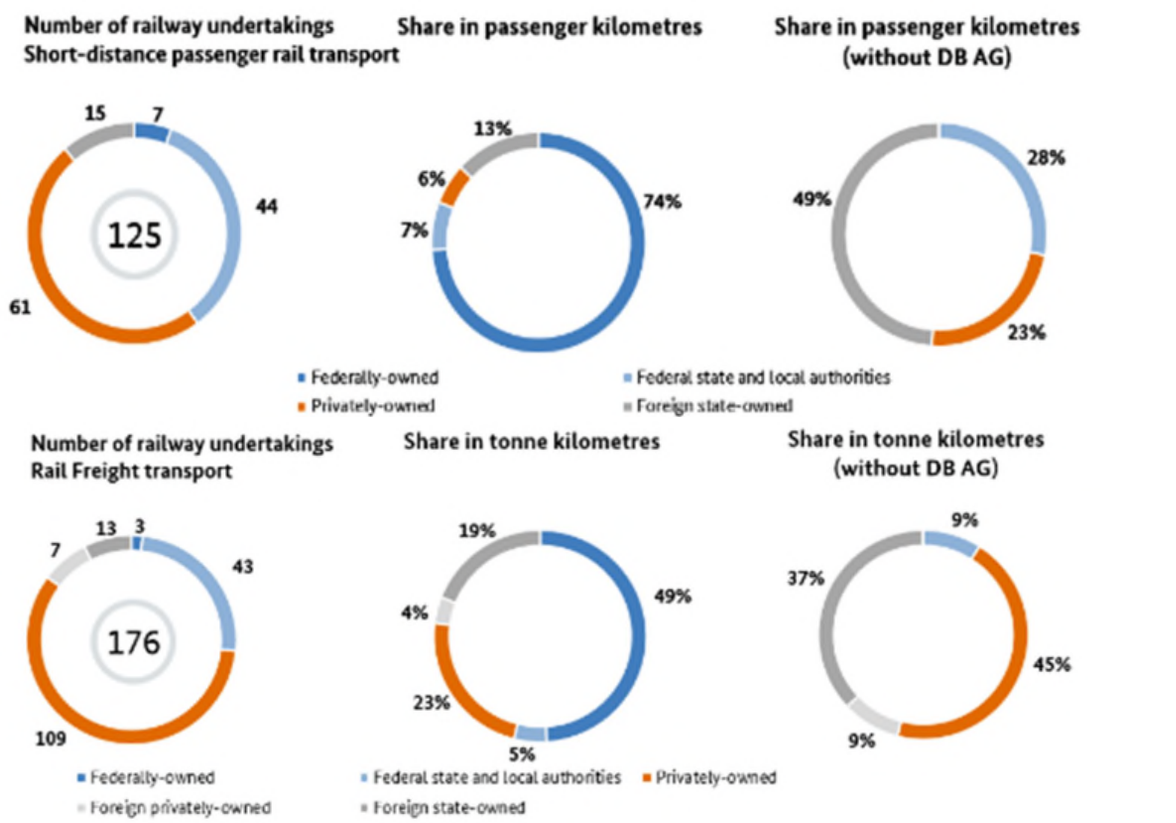


Figure 19: Ownership structures of railway undertakings (2018, number/share of traffic handled in percent)

Revenue development in the rail transport market

Revenue generated per train-kilometre travelled in the short-distance passenger rail transport segment rose from €15.50 in 2017 to €16.00 in 2018.

In the 2018 reporting year, railway undertakings generated revenue of 19.6 cents per passenger-kilometre in the short-distance passenger rail transport segment. This was a further increase over the previous reporting period.

Average train occupancy in the short-distance passenger rail transport segment remained constant at 82 passengers per train in 2018.

Non-federally owned railways reported €13.90 in revenue per train-kilometre and an average of 64 passengers per train.

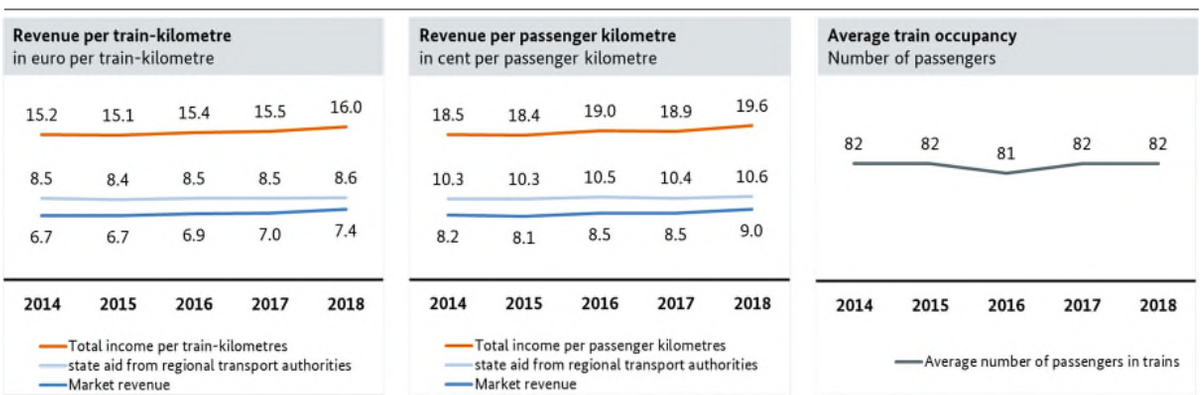


Figure 20: Development of revenues and average train occupancy in the short-distance passenger rail transport (2014-2018)

In contrast to the short-distance passenger rail transport segment, train occupancy in the long-distance passenger rail transport segment is noticeably higher. As a result, revenue per train-kilometre travelled is nearly twice as high as in the short-distance passenger rail transport segment. However, since subsidies are generally not paid in the long-distance passenger transport segment, revenue approximately 10.6 cents per passenger-kilometre is considerably lower than in the short-distance segment. Compared to 2017, revenue generated in the long-distance passenger rail transport segment continued to increase, after having fallen in the years up to 2016.

The average number of passengers per train in the long-distance passenger rail transport segment increased from 289 to 296. This figure has risen significantly in recent years.

Revenue generated per train-kilometre travelled in the long-distance passenger rail transport segment increased year-on-year from €30.00 to €31.30 per train-kilometre.

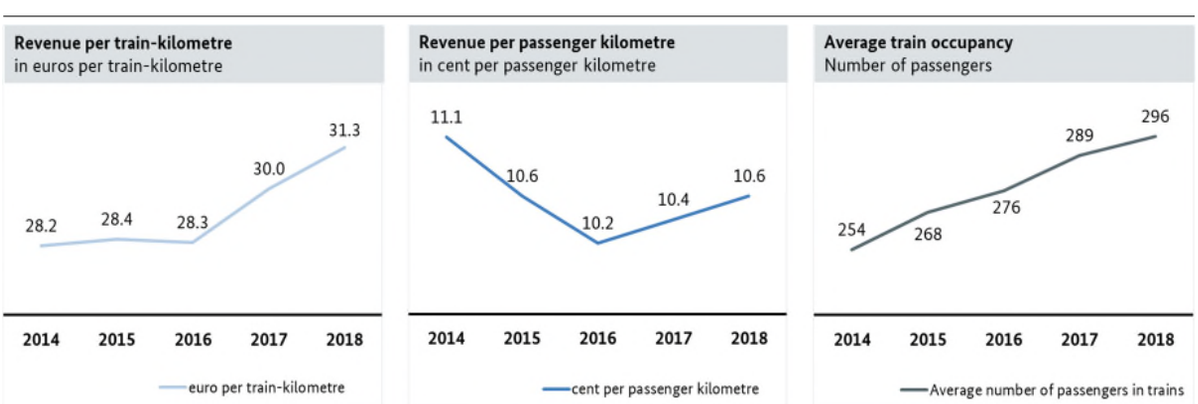


Figure 21: Development of revenues and average train occupancy in the long-distance passenger rail transport (2014-2018)

In the rail freight transport segment, revenue fell to 4.2 cents per tonne-kilometre in 2018 after having remained constant in the previous years.

The transport volume per train increased once again, reaching 503 tonnes per train in the 2018 reporting year.

Revenue per train-kilometre was €21 in 2018. This was a slight decrease over 2017.

The second chart below shows the figures for non-federally owned railways. Here, revenue per train-kilometre declined to €15.70.

Revenue per tonne-kilometre fell slightly over the previous year to approximately 3.0 cents per tonne-kilometre in 2018.

For non-federally-owned railways, the average freight load per train was 516 tonnes in 2018. An increase can be observed since 2014.

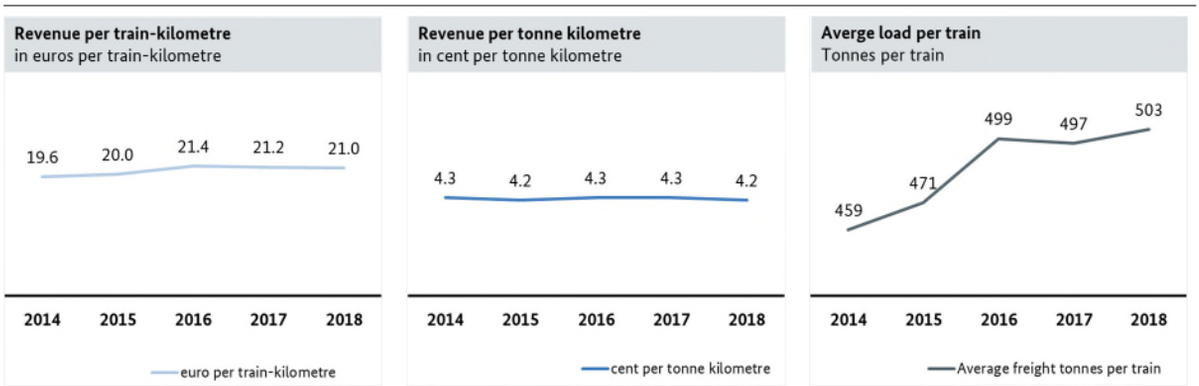


Figure 22: Development of revenues and average freight load in the rail freight transport (2014-2018)

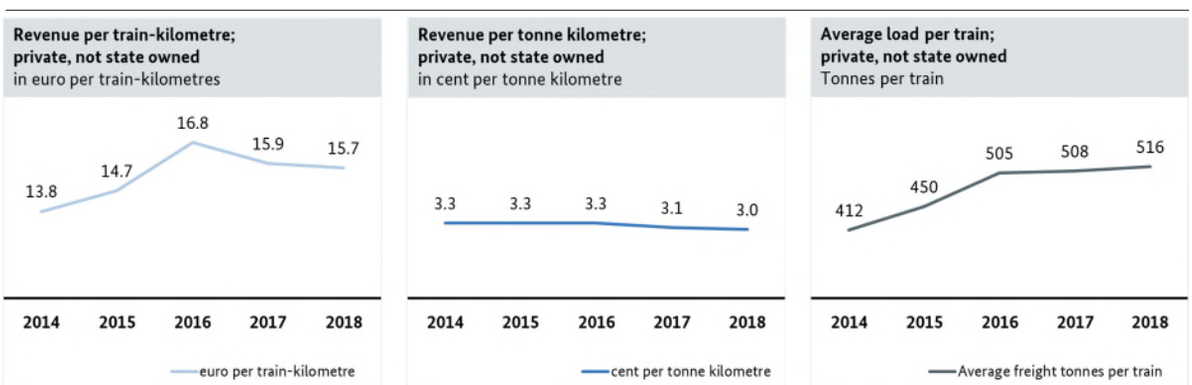


Figure 23: Development of revenues and average freight load of non-federally owned railways in the rail freight market (2014-2018)

Development of retail prices

The Bundesnetzagentur's regulatory activities in the railway sector affect prices for passengers of railway undertakings only indirectly because the regulated infrastructure charges comprise only part of the fare and transport prices to be paid. However, ticket prices – alongside convenience and the range of the offerings – are very important when assessing how attractive passenger rail services are or how competitive they are at intermodal level. Transport charges are also an important criterium for freight customers in the rail freight transport segment when deciding whether or not to use rail transport services.

In order to assess how retail prices have developed, the Bundesnetzagentur draws on indices made available to the public by the Federal Statistical Office and on its own data analyses. These indices show the development of prices for defined services based on the same fixed quantities, whereas the average revenue per tonne-kilometre or passenger-kilometre as determined by the Bundesnetzagentur additionally reflects differences in the quantities of the demanded products or services.

For example, changes in the demand for rail passes or discount offers such as special prices or the BahnCard railcard can impact the development of these particular market revenues.

This explains why the price indices published by the Federal Statistical Office tend to reflect the perspective of end customers who monitor price trends for a specific service. By contrast, examining specific charges allows for a more precise assessment of the revenue development from the railway undertakings' perspective.

Using 2014 as the base year, the index for fares in the short-distance passenger rail transport segment rose by nearly 14 percent between 2014 and 2018. Looking at the railway undertakings, fare revenue per passenger-kilometre (pkm) increased by ten percent and total revenue per passenger-kilometre, including public subsidies, grew nearly six per cent.

The index for fares in the long-distance passenger rail transport segment likewise rose faster than the revenues generated per passenger-kilometre. The fare index in this segment rose by a total of 3.6 percent during the period 2014 to 2018. Revenue generated per passenger-kilometre fell by 3.5 percent during the same period. This was primarily due to a greater number of reduced-price tickets (including budget fares) being offered in response to the intermodal competition that has grown significantly in recent years as a result of long-distance intercity coach service.

Looking at the rail freight transport market, the average revenue generated by railway undertakings per unit of measure (tkm) declined slightly between 2016 and 2018. By contrast, the transport prices reported to the Federal Statistical Office increased.

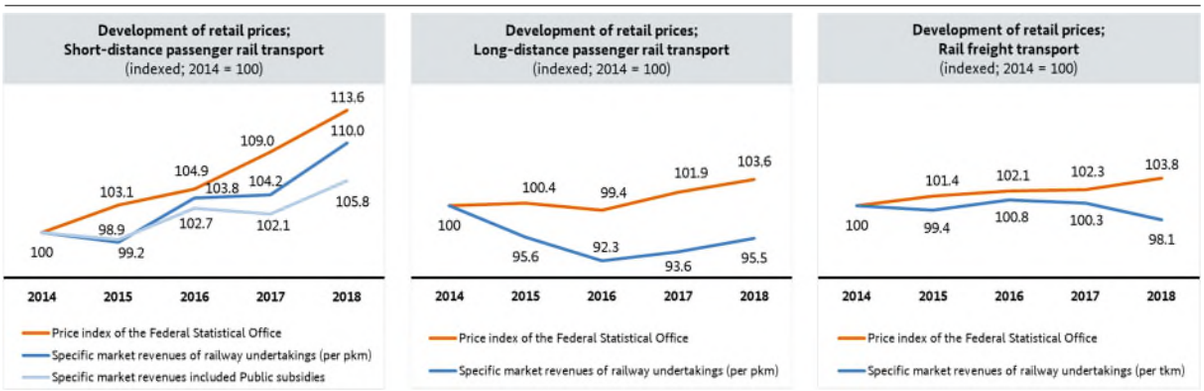


Figure 24: Development of retail prices (2014-2018; indexed 2014 = 100)

Construction measures scheduled by the infrastructure managers

Looking at the subject of scheduled construction measures to be undertaken by the infrastructure managers, railway undertakings have the opportunity to provide their own assessment, based on a scale from “applies completely / very often” to “average” all the way to “does not apply/applies only seldom”. The following two charts show how the respondents rated this set of topics. Compared to the previous year, the railway undertakings assigned better ratings to the points pertaining to the provision of information and the opportunity to exert influence on construction measures.

Seventy-six percent of the railway undertakings indicated that they had frequently been informed on a timely basis of construction measures scheduled during the period covered by the working timetable. There was no change over the previous year in this area.

More than half of the railway undertakings surveyed (58 percent) stated that they had received timely information regarding construction measures to be conducted during the course of the year. The overall average rating improved slightly, from 2.5 in the previous year to 2.4 in the latest survey.

Approximately half of the railway undertakings (48 percent) reported that they were frequently included in the planning of the construction measures. However, nearly one out of every four (24 percent) said they were rarely included in the planning of construction measures. The average rating remained unchanged at 2.8.

Forty-four percent of the railway undertakings reported that they were seldom able to exert any influence on the planning of construction measures. Approximately one-third (29 percent) of the railway undertakings were able to frequently exert influence on the planning of construction measures. The average rating here improved to 3.3.

This last value in particular clearly shows where railway undertakings consider the infrastructure managers’ greatest deficits to lie. The railway undertakings’ requirements and the infrastructure managers’ activities are not in line with one another.

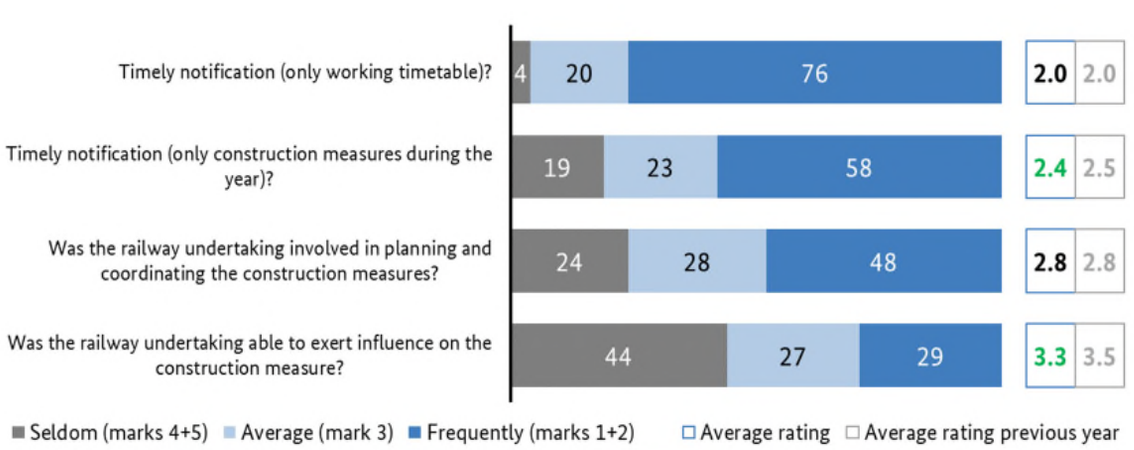


Figure 25: Ratings of the infrastructure managers' scheduled construction measures (2019; ratings in percent and average marks)

A total of 61 percent of the railway undertakings said that it was often necessary to use diversionary routes due to construction measures. One in every four (25 percent) said that they seldom needed to use the diversionary routes. Compared to the previous year, the average rating worsened, from 3.4 to 3.5.

Fifty-two percent of the railway undertakings reported that it was seldom necessary to provide replacement bus service during construction measures. However, 39 percent reported that this had often been the case for them. The overall average for this focal area worsened to 2.6.

More than one-third (35%) of all railway undertakings were affected relatively frequently by late notifications of changes in plans or deviations from the original plans for construction measures. Compared to the previous year, this figure worsened, from 2.8 to 2.9.

More than one out of every three (37 percent) railway undertakings stated that there were frequent deviations from the original plans when construction measures were conducted. Thirty percent reported that this was generally seldom the case. The average rating in this category worsened, from 2.8 to 3.0.

The railway undertakings again complained about the reliability of the scheduled time frames for construction measures. These time frames are often too short and consequently cannot be complied with. The uncertainty about the completion of construction work makes it more difficult for railway undertakings to plan their operations.

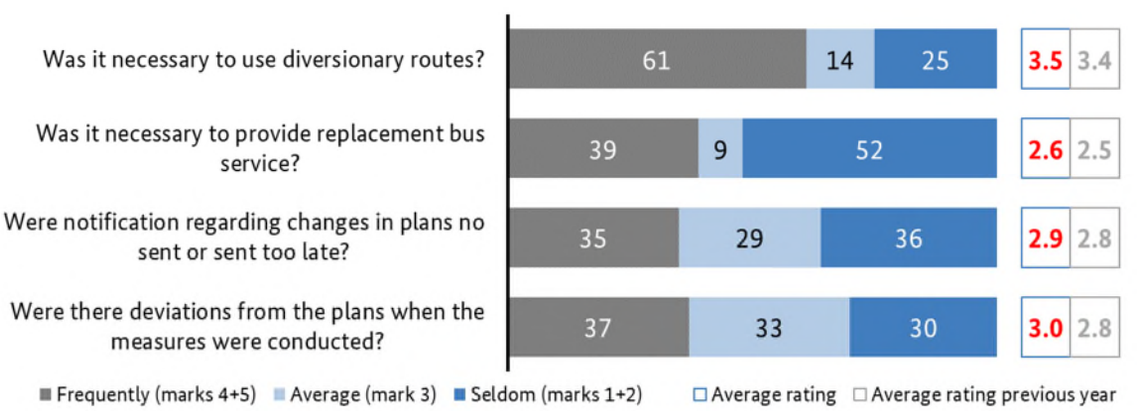


Figure 26: Ratings of the infrastructure managers' scheduled construction measures (2019; ratings in percent and average marks)

Comments by the railway undertakings

As part of the market survey, railway undertakings have the opportunity to draw attention to issues or problems that are important to them. In addition to rating general influencing factors (see the chapter “Ratings for access to railway infrastructure”), railway undertakings can voice their concerns about specific issues. The comments received during the survey carried out in 2019 revolved particularly around the issues: construction measures scheduled by the infrastructure managers, timetables, dispatching, and communication.

The comments made regarding timetable quality and dispatching can be broken down into different categories. Some of the railway undertakings expressed complaints about their communications with staff in DB’s operations control centre. They noted that communication had improved but smaller enterprises in particular were not able to assert themselves or effect changes in allocation.

The training and communication skills of the staff at the operations control centre were mentioned again this year. The respondents reported that information regarding the timetables was not clearly communicated or was provided at very short notice. The lack of necessary skills among the personnel deployed is particularly noticeable in connection with construction sites and all disruptions because unworkable timetables are drawn up and it is apparent that the personnel is unable to handle the situation.

Another important point of criticism involves the available train-path capacity. The level of infrastructure capacity utilisation is so high, they said, that there are delays and cancellations. It was also mentioned that full use was always made of the calculated time buffers, which in turn inevitably leads to delays.

The fact that the entire infrastructure is overloaded was not the only reason for this, they said, adding that it was also due to the large number of construction sites. In some cases, the use of diversionary routes that are necessary for bypassing construction sites brings enormous increases in the length of the routes that the railway undertakings involved have to travel. As a result, providing service is not very worthwhile in some cases.

In addition, comments were submitted regarding access to train formation facilities and marshalling yards. Due to the shortage of existing infrastructure, the charges quoted for infrastructure use are also moving higher, the respondents said. This development is viewed critically.

Looking at the subject of construction measures, some railway undertakings reported that information is being passed on only at very short notice or not at all. Here, they often criticise that many rail sidings are used to park construction vehicles and are therefore not available for regular traffic.

Electric traction in the railway market

Critical awareness of climate change and its effects has grown in society in recent years. By the same token, the causes of climate change and their elimination are the subject of public debate. The growing volume of traffic in all areas is a major contributor to the damage to Earth's climate.

Being an environmentally friendly mode of transport, railways make an important contribution to environmentally friendly mobility. Most trains in Germany's railway network use electric traction. Thanks to the use of modern vehicles with three-phase AC drive systems, the railway is the only mode of transport capable of recovering large amounts of the energy used during operation and feeding it back into the grid.

Electrified routes currently account for just under 53 percent of all routes in Germany. Of the approximately 39,200 kilometres in route length, a little more than 20,630 kilometres were electrified in 2018. Electric traction was used to provide around 72 percent of the transport performance in the German railway network. This corresponds to more than 800,000,000 train-kilometres. The share of electric traction used in the German railway market varied from transport segment to transport segment. The short-distance passenger rail transport segment accounted for considerably more than half of the total railway transport performance using electric traction. Rail freight transport was responsible for just under 27 percent of total electrified transport and the long-distance passenger rail transport segment accounted for nearly 18 percent. The share held by other transport services was less than one percent.

The shares of electric transport services provided vary from transport segment to transport segment. The long-distance passenger rail transport segment provided slightly less than 98 percent of its transport performance using electricity. This figure was slightly more than 63 percent in the short-distance passenger rail transport segment. In the rail freight transport segment, nearly 86 percent of transport performance was provided using electricity. The share was approximately 30 percent for other types of transport. Electric traction was used to provide more than 99 percent of the transport performance in the long-distance passenger rail transport segment. This figure was nearly 79 percent for the short-distance passenger rail transport segment. Looking at the rail freight transport segment, the share of electric transport performance was more than 87 percent.

Rolling stock

Since 2011, the Bundesnetzagentur has analysed the inventory of rolling stock that is registered in Germany. Here, it draws on information regarding rolling stock that is entered as active in the German register of rolling stock at the end of the respective calendar year. In addition, it uses the latest VKM list[3] from the ERA[4] for its analyses.

[3] VKM - Vehicle Keeper Marking

[4] ERA - European Railway Agency

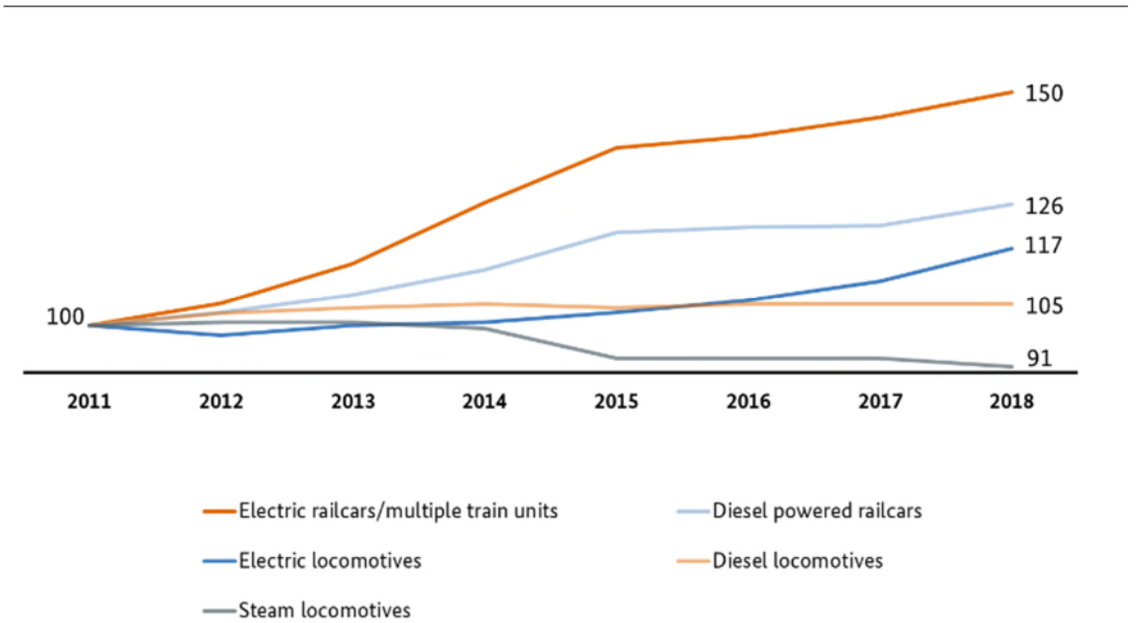


Figure 27: Development of powered rolling stock (2011-2018; change in percent; indexed 2011 = 100)

The stock of powered railway vehicles has increased by 20 percent since 2011. Approximately 13,600 powered railway vehicles[5] were registered in Germany at the end of 2018. These included locomotives, power units, railcars and multiple train units, insofar as they can operate as the smallest unit. At nearly 37 percent, railcars and multiple unit trains posted the largest increase during the last eight years, followed by electric locomotives with nine percent. The number of diesel-powered locomotives increased by nearly six percent between 2011 and 2018.

The number of mainline locomotives increased by a substantial 12 percent while the number of smaller diesel-powered locomotives with a maximum speed of less than 100 km/h remained virtually constant. In the case of these locomotives which are used primarily for shunting services and in close range, increasing use is being made of vehicles with hybrid systems.[6] The share held by smaller diesel-powered locomotives with a hybrid drive system grew to approximately two percent in 2018, based on a stock in the middle double-digit range.

[5] Not counting the Hamburg and Berlin suburban railways.

[6] Hybrid drive: The diesel-powered drive is supported by an electric motor that uses rechargeable batteries.

Stock reductions have been undertaken since 2011, particularly for locomotives that are used by museums such as steam-driven locomotives and electric locomotives with a maximum speed of less than 100 km/h. All in all, this stock shrank by approximately nine percent. The number of various older electric locomotives with conventional drive systems (commutator) has also declined. This decline has however been more than compensated for by the commissioning of modern electric locomotives with three-phase electric motors.[7] Based on the entire vehicle fleet with electric drives in the German vehicle register (electric locomotives, railcars/multiple train units), slightly less than 75 percent of the electrically powered vehicles were equipped with modern three-phase technology as of the end of 2018. The share of vehicles with three-phase electric drive systems has grown by approximately 70 percent since 2011.

The share of traditional passenger coaches continued to decline. The stock of these vehicles has declined by some 14 percent in the years since 2011 to just under 7,900. This decrease is compensated for through the increased acquisition of railcars and multiple train units for passenger transport. When all of the middle and end cars from the largely multi-unit railcars and multiple unit trains are added together, their total share in the last six years has increased by more than 50 percent to more than 17,000 individual units which are available for passenger transport service. As a result, the number of individual units in operation in the railway network is more than 5,600 greater than in 2011.

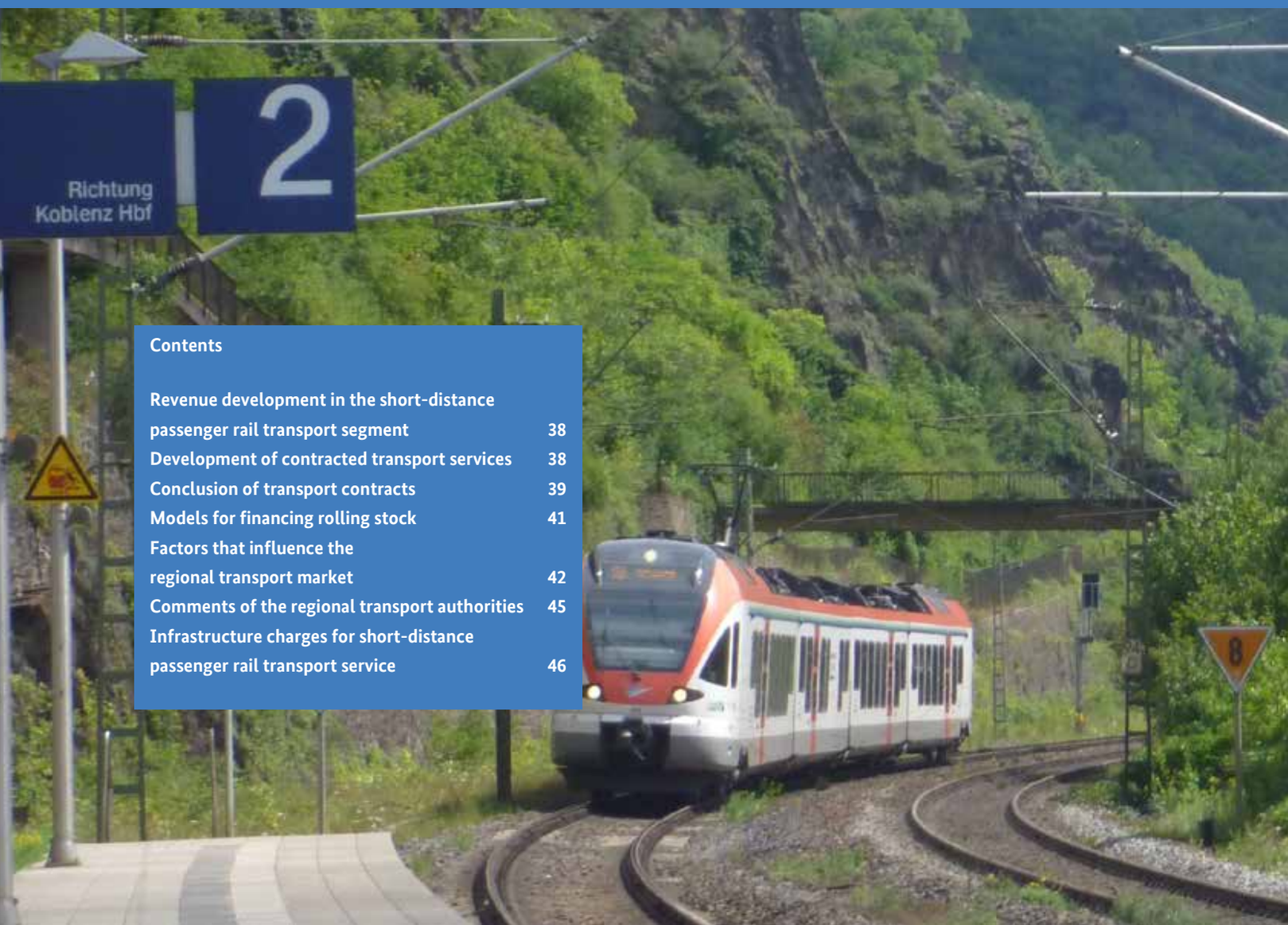
The stock of freight cars has decreased by nearly 11 percent since 2011. However, it has stagnated at approximately 166,000 for the last three years.

The number of foreign keepers of rolling stock that is registered in the German register of rolling stock nearly doubled in the years from 2011 to 2018. Consequently, the number of vehicles they hold that are registered in Germany also increased markedly. The number of traction units alone has increased by more than 550. The stock of traction units has thus more than quintupled since 2011. The largest increases were seen in the number of modern electric locomotives and newer shunting locomotives. In addition, many older vehicles in the register of rolling stock changed owners. The share of freight cars held by foreign keepers increased by more than 26 percent compared to 2011, to nearly 36,000.

[7] Three-phase drive systems make it possible to feed energy recovered by electric brakes back into the grid.

Financing short-distance passenger rail transport service

Germany's federal states are entitled to receive regionalisation funds from federal tax revenue in order to provide local public transport. The federal states use regionalisation funds to finance short-distance passenger rail transport service.



Contents

Regional transport authorities and the short-distance passenger rail transport segment

The share of transport services that are contracted on the basis of competitive tendering continues to grow. The number of transport contracts concluded by the regional transport authorities declined slightly.

Revenue development in the short-distance passenger rail transport segment

The most important sources of revenue for the railway undertakings operating in the short-distance passenger rail transport segment - in a ddition to market revenue - are public subsidies which bodies (regional transport authorities) contracting short-distance passenger transport services pay to the railway undertakings that have been contracted to provide transport. These subsidies come largely from funds which the federal government makes available to Germany's federal states under the Regionalisation Act from 27 December 1993. Nearly €8.5 billion in regionalisation funds were allocated in 2018.

Using a breakdown of the revenue components, the following chart shows the importance of public subsidies for the short-distance passenger rail transport segment. This share remained unchanged at 55 percent in 2017 and 2018.

Market revenue (primarily from the sale of tickets) accounted for up to 45 percent of the revenue generated by short-distance passenger rail transport.

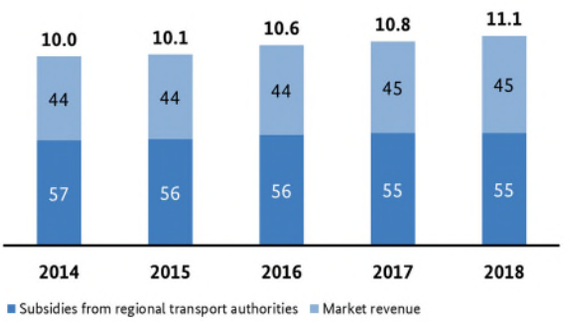


Figure 28: Share of subsidies from regional transport authorities in revenue generated in the short-distance passenger rail transport segment (2014-2018; revenues in billions of euros, shares in percent)

Development of contracted transport services

Transport performance in the short-distance passenger rail transport segment in 2018 increased to more than 691 million train-kilometres.[8] The market share held by non-federally owned railway undertakings increased from 33 to 35 percent. As a result, a little more than one-third of the train-kilometres in the short-distance passenger rail transport segment are provided by non-federally owned railway undertakings.

[8] This involved only contracted transport service in the short-distance passenger rail transport segment.

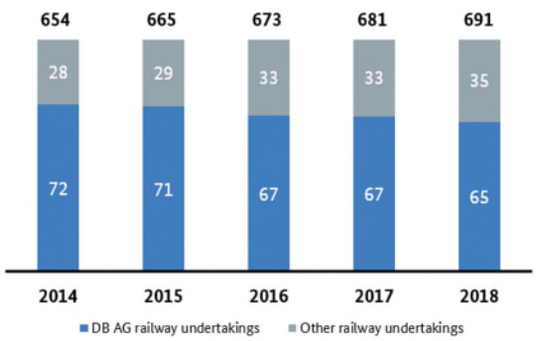


Figure 29: Development of market shares for contracted transport services in the short-distance passenger rail transport segment (2014-2018; operating performance in millions of train-kilometres and shares in percent)

Conclusion of transport contracts

Regional transport authorities contract railway undertakings to provide short-distance passenger rail transport services. These contracts are largely awarded through tendering. Under certain conditions, particularly in the case of transitional contracts or short-term contracts, competitive tendering was not used as the basis for awarding contracts. The number of transport contracts concluded increased sharply between 2014 and 2015. This was followed by a marked fall in the number of concluded contracts starting 2015 until 2018. The regional transport authorities expected 31 transport contracts to be concluded in 2019.

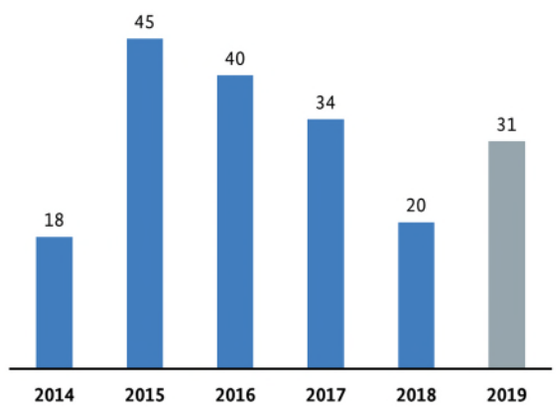


Figure 30: Number of concluded transport contracts and anticipated number of concluded transport contracts (2014-2019; number)

Of the 20 transport contracts awarded by regional transport authorities in 2018, 13 were awarded by competitive tendering and seven were awarded without the use of the tendering process. In comparison to the same period last year, there was a decline in the number of contracts awarded by competitive tendering and in the number of contracts awarded without the use of the tendering process.

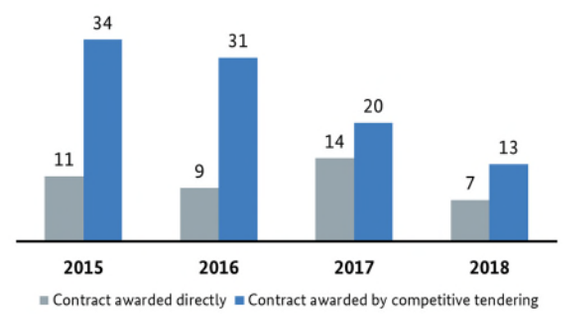


Figure 31: Transport contracts awarded by regional transport authorities, by competitive tendering and by direct award (2015-2018; number)

When only contracts awarded by competitive tendering are considered, bidders submitted a total of 32 offers for the 13 transport contracts concluded in 2018. This means that on average a little more than 2.4 bidders took part in the respective contract-award procedure. This was a slight increase over the level seen during the 2017 reporting year.

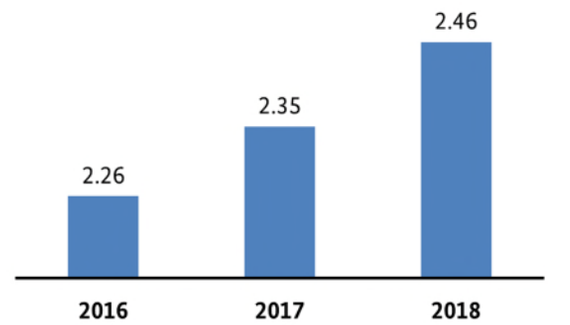


Figure 32: Average number of bidders for transport contracts awarded by regional transport authorities on the basis of competitive tendering (2016-2018; number)

Approximately 77 percent of all train-kilometres provided in 2018 were contracted through the tendering process and slightly more than 23 percent were awarded without the use of tendering. The share of contracts awarded through competitive tendering has increased significantly since 2014.

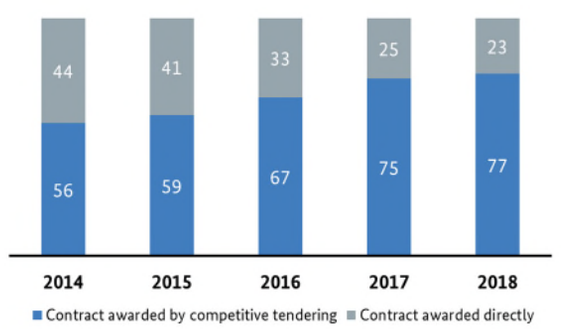


Figure 33: Breakdown of contract-award procedures in the short-distance passenger rail transport segment (2014-2018; shares of train-kilometres in percent)

Seven transport contracts were awarded without the use of tendering in 2018. Five of these contracts were awarded to railway undertakings belonging to Deutsche Bahn AG and two were awarded to non-federally owned railway undertakings in the short-distance passenger rail transport segment.

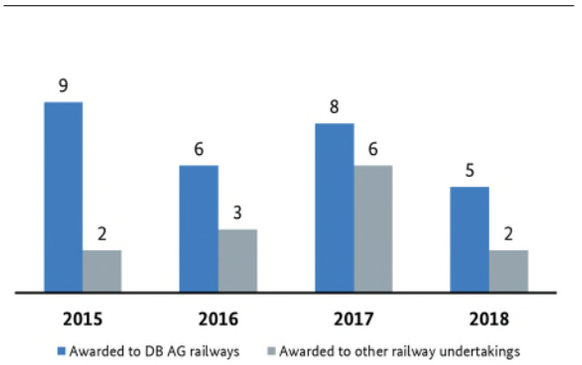


Figure 34: Award of transport contracts by regional transport authorities to railway undertakings, without tendering (2015-2018; number)

Of the 13 transport contracts awarded by regional transport authorities through competitive tendering during the 2018 reporting year, three were awarded to Deutsche Bahn AG railway undertakings and 10 were awarded to non-federally owned railway undertakings in the short-distance passenger rail transport segment.

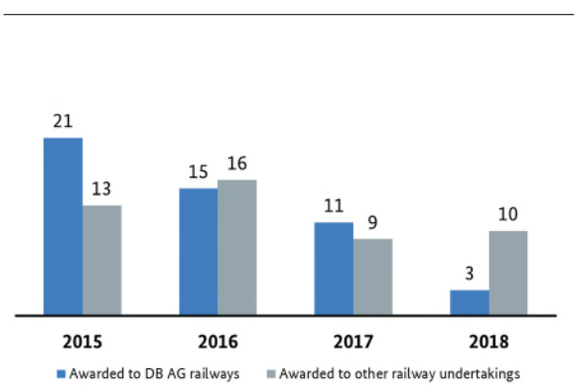


Figure 35: Award of transport contracts to railway undertakings by regional transport authorities, by competitive tendering (2015-2018; number)

During the 2018 reporting year, more than 65 percent of the awarded train kilometres covered by concluded transport contracts were awarded to non-federally owned railway undertakings. Approximately 35 percent of the train kilometres from concluded transport contracts were awarded to railway undertakings belonging to Deutsche Bahn AG. Looking at transport contracts which the regional transport authorities concluded during the 2017 reporting period, approximately 75 percent of the train kilometres were awarded to federally owned railway undertakings.

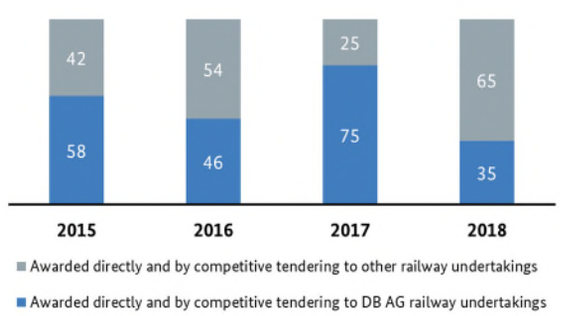


Figure 36: Share of awarded train kilometres from concluded transport contracts, by year (2015-2018; shares in percent)

Models for financing rolling stock

In five out of the 20 transport contracts concluded in 2018, the regional transport authorities included an offer to provide assistance with financing rolling stock.

The financing models offered by the railway undertakings included a reuse guarantee for the rolling stock, a reuse guarantee with a waiver of objection, and a combined model consisting of the reuse guarantee for the rolling stock, a debt servicing guarantee and an assignment of security.

In the case of each of the five transport contracts that included an offer for financing assistance, the respective railway undertaking took advantage of the model offered by the regional transport authorities.

Factors that influence the regional transport market

Regional transport authorities participating in the annual market analysis have the opportunity to evaluate and rate market-related aspects on a scale of 1 (very good) to 5 (unsatisfactory). The regional transport authorities' assessments of short-distance passenger rail transport in 2019 were in some cases worse than in the previous year. More than half of the regional transport authorities (55 percent) gave the level of network development poor ratings. Only about one out of every three regional transport authorities (30 percent) gave an average rating for this area. Compared to the previous reporting period, the average rating worsened noticeably, from 3.0 to 3.5.

The regional transport authorities assigned train-path condition an average rating of 3.3. This rating did not improve over the previous year. Forty-one percent of the regional transport authorities rated this factor with a four or five ("poor").

The regional transport authorities for short-distance passenger rail transport gave the condition of passenger stations a rating of 3.0 in 2019. This was the same rating as in the previous year. Their rating of the level of modernisation of passenger stations averaged 2.9. Somewhat less than half of the regional transport authorities (41 percent) gave this factor a rating of 3.0.

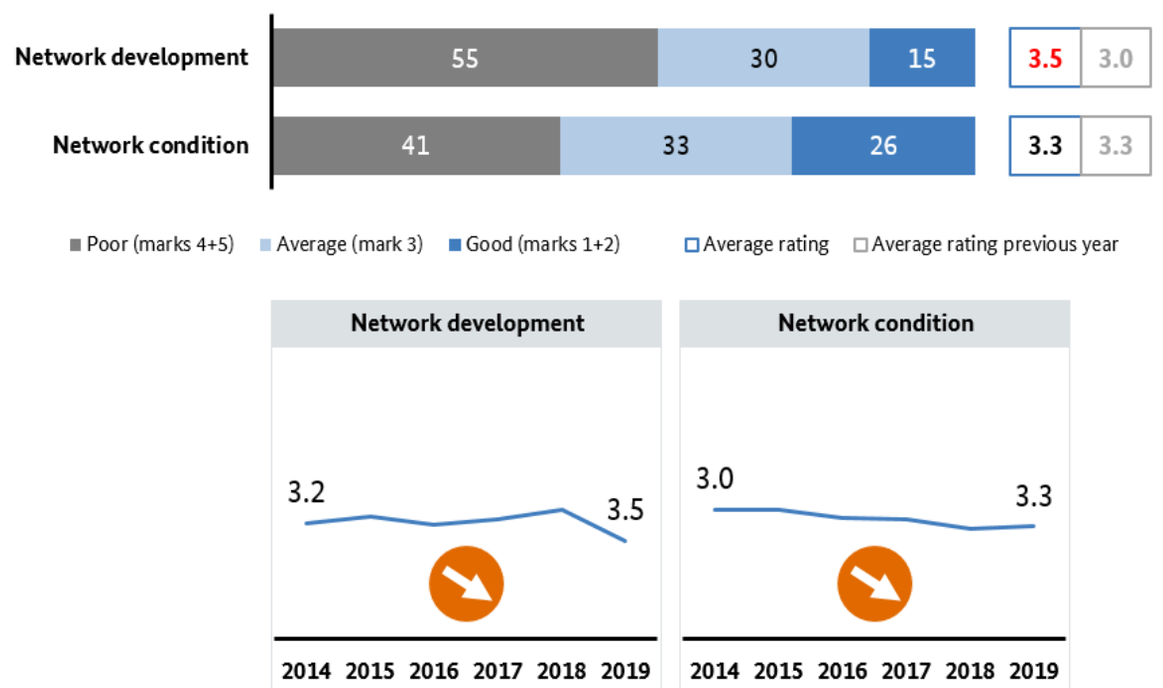


Figure 37: Ratings for train network development and network condition assigned by regional transport authorities for short-distance passenger rail transport (2014-2019)

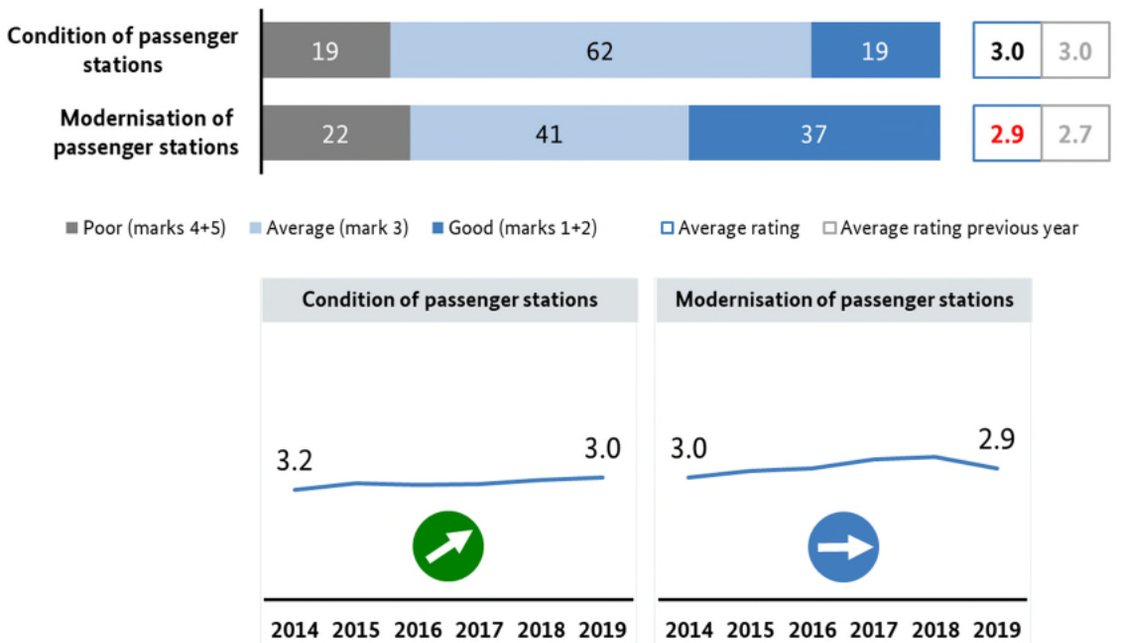


Figure 38: Ratings for the condition and level of modernisation of passenger stations and stopping points assigned by regional transport authorities for short-distance passenger rail transport (2014-2019)

The regional transport authorities gave a rating of 2.6 for the level of non-discrimination in the infrastructure managers' pricing systems for station use. This rating was better than in the previous reporting period when the overall rating was 2.9. The regional transport authorities gave an average rating of 2.5 for the level of non-discrimination in track access pricing systems, the same as in the previous year.

Looking at passenger stations, the regional transport authorities gave the infrastructure managers' price-performance ratio a rating of 3.4. They assigned a 3.6 just the year before. The infrastructure managers' price-performance ratio for train paths received a rating of 3.4 from the regional transport authorities, the same rating as in the previous year.

Viewed over the long term however, the ratings assigned the level of non-discrimination in the pricing systems and the price-performance ratio have developed positively. In 2014, station usage pricing systems received a rating of 4.1, while the track access pricing systems were given a 3.7.

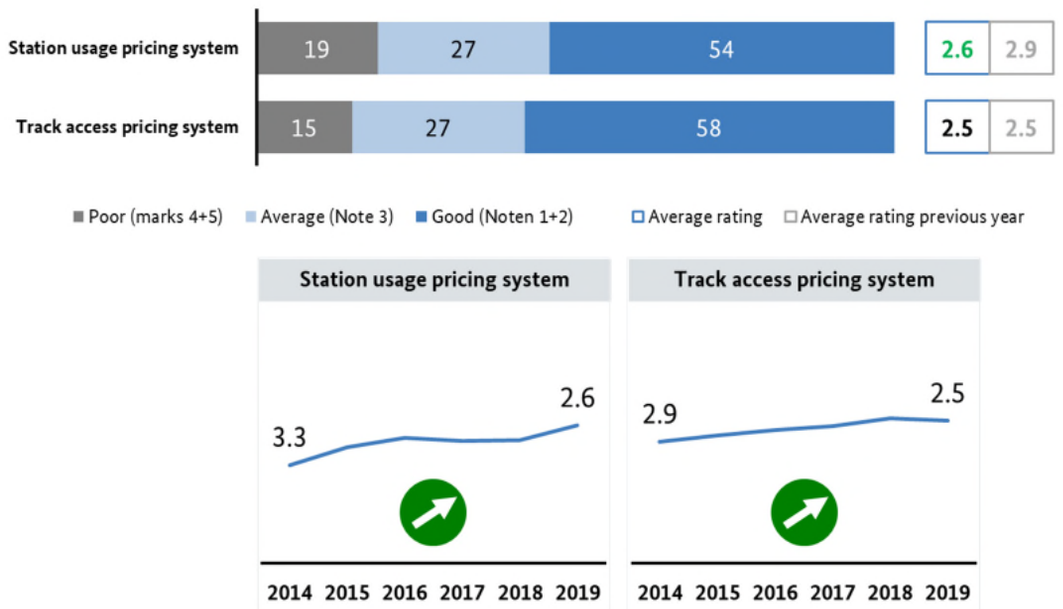


Figure 39: Regional transport authorities' rating of the level of non-discrimination in the infrastructure managers' pricing systems (2014-2019)

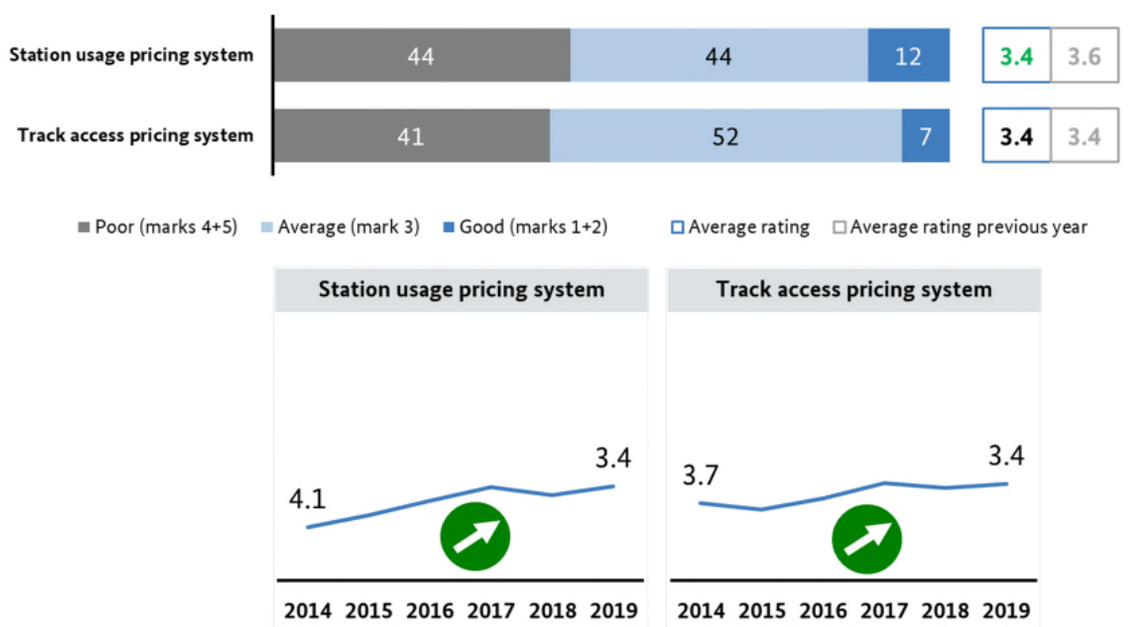


Figure 40: Regional transport authorities' rating of the infrastructure managers' pricing systems (2014-2019)

Comments of the regional transport authorities

As part of the annual market survey, regional transport authorities have the opportunity to inform the Bundesnetzagentur of their recommendations, tips and requests for its future regulatory work. They can also provide comments, advice and information about their own experience relating to access to the railway infrastructure market.

Construction measures

The regional transport authorities pointed out in particular that DB Netz AG did not sufficiently coordinate construction measures. In addition, the diversionary routes used during the construction measures did not have sufficient capacity, they said, noting that this had corresponding material consequences for the regional transport authorities and the railway undertakings, such as loss of revenue and the use of replacement bus service. Better control of the cost of construction measures and less expensive construction were also desirable according to the comments. In addition, they commented that unjustifiably long or short-notice line closures should be reviewed.

Train paths

In this area, the regional transport authorities would like to see better regulation of train-path requests. In addition, they want regular interval and system train paths to be strengthened vis-à-vis individual trains that are not part of interval service. The railway network must be made more robust through the addition of more crossovers, overtaking tracks and stations with passing loops. The comments also noted that the dispatching rules have to be reworked so that very delayed trains do not cause the more punctual trains in the short-distance passenger rail transport segment to also be delayed. Criticism also extended to the requests for large numbers of train paths in the long-distance passenger and freight traffic segments. No use is made of many of these requests, the regional transport authorities said, noting that this wrecks connections and regular interval service.

Stations

Looking at stations, the regional transport authorities would like to see greater transparency in the pricing system and cost increases for railway undertakings and regional transport authorities. Further, all potential available for providing dynamic passenger information (in some cases the systems are outdated or expensive) ought to be tapped. The condition of the stations is also the subject of criticism; respondents report that significant deficiencies have existed for years.

Sales

According to the respondents, it should be ensured that dominant sales service providers offer all railway undertakings person-to-person sales services at the same conditions.

Light maintenance depots

The regional transport authorities called for eliminating the potential for discrimination on the part of railway undertakings when other railway undertakings use light maintenance depots. This must be ensured, they said, by conducting effective reviews of the annual charges for using light maintenance depots under a short-distance passenger rail transport service contract.

Provision of data

Data that has been gathered in connection with market monitoring should be more widely published, the respondents noted. Collected data or published overviews continue to be in short supply in the generally regional short-distance rail passenger transport segment in 2019, they added.

Regulation

According to the comments, a more effective incentive system for quality assurance is needed.

Costs

The costs for using infrastructure must be lowered, the respondents noted, adding that efficiency must serve as the yardstick in cost regulation. Further, they said DB Netz AG should bear the follow-on costs arising, for example, from construction measures or the use of replacement bus service.

Infrastructure

Efforts should be made, the regional transport authorities commented, to increase the reliability of existing infrastructure (particularly railway crossings, switches and tracks) by improving maintenance and conducting inspections more often.

Infrastructure charges for short-distance passenger rail transport service

In 2018, federally owned infrastructure managers generated a total of €4.15 billion in revenue from track access and station usage charges for short-distance passenger rail transport services. This is about 49 percent of the approximately €8.5 billion in regionalisation funds allocated to Germany's federal states.

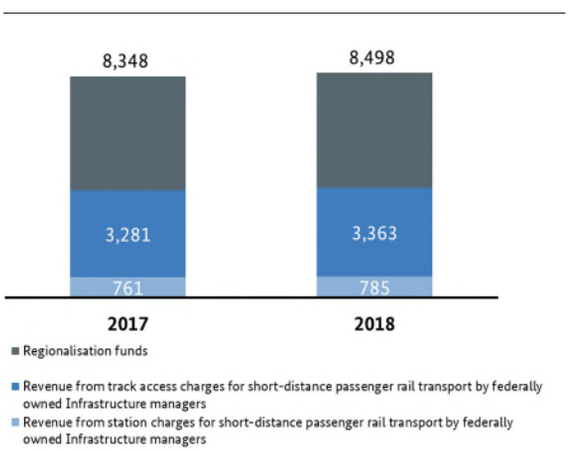


Figure 41: Regionalisation funds and revenue generated by federally owned infrastructure managers in the short-distance passenger rail transport segment (2017-2018; in millions of euros)

Rate calculation and mandate to review

In the case of federally owned infrastructure managers, the level of the charge for runs undertaken by the short-distance passenger rail transport segment is set pursuant to Section 37 of the Railway Regulation Act primarily by the charge applicable to the 2016/2017 working timetable period, increased by the rate at which the regionalisation funds are increased. The Bundesnetzagentur received the mandate to examine on a regular basis whether, based on this provision, the costs incurred by federally owned infrastructure managers in the short-distance passenger rail transport segment are not fully covered. The Bundesnetzagentur will publish a report on its findings and forward it to the federal government. The first report was completed in 2019 and focuses on the situation in the reference year 2017. It can be accessed at:

Cost recovery at DB Netz AG

In 2017, DB Netz AG generated approximately €4.9 billion in revenue from track access charges, with the short-distance passenger rail transport segment accounting for most – some €3.2 billion – of this amount. DB Netz AG incurred costs of approximately €5.45 billion (including imputed costs) in connection with services from the minimum access package. The share of this that is attributable to transport services provided in the short-distance passenger rail transport segment can only be estimated due to the large share of overhead costs in the infrastructure. In addition, the costs of the minimum access package were allocated to the different transport services based on how much the market is able to bear, pursuant to Section 36 of the Railway Regulation Act.

Therefore, the amount of costs allocated to the short-distance passenger rail transport segment ranges from around €2.9 billion to approximately €3.9 billion. As a result, neither an over-recovery nor an under-recovery of costs for transport services in the short-distance passenger rail transport segment could be ascertained for 2017.

Cost recovery at DB Station&Service AG

DB Station&Service AG generated approximately €850 million in revenue from station charges in 2017. Short-distance passenger rail transport accounted for €750 million, a large share of the total. After deducting other revenues and earning, costs totalling some €910 million (including imputed costs) were incurred in the area of train stations. The costs were allocated to the individual transport services using a model-based calculation. Depending upon the type of classification method used, costs ranging from approximately €700 million to around €860 million are attributable to short-distance passenger rail transport services. As a result, neither an over-recovery nor an under-recovery of costs for transport services provided in the short-distance passenger rail transport segment could be determined for DB Station&Service AG for 2017.

Development of volume and revenue

Examining volume and revenue structure is another method of analysis. With this method, it is possible to analyse how transport performance and revenues from track access charges and station charges have developed over time and then compare them with the development of costs for infrastructure managers and the development of regionalisation funds. The following diagram shows the development of transport performance in the individual transport segments and the revenues generated from (nominal) track access charges, each in relation to federally owned railway line infrastructure operators and based on 2017, the base year used in the provisions set forth in Section 37 of the Railway Regulation Act.

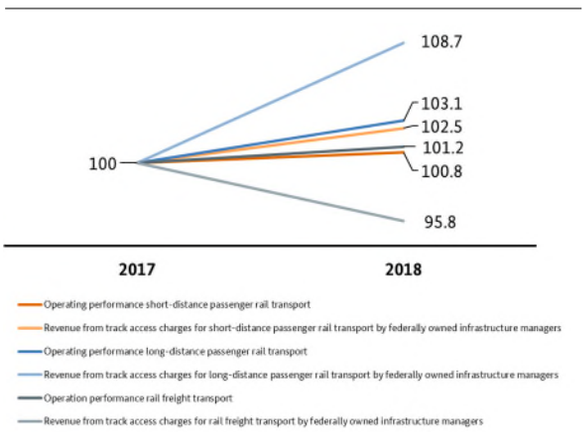


Figure 42: Development of transport performance and revenue generated from track access charges by federally owned infrastructure managers (2017-2018; indexed 2017 = 100)

The amount of transport services provided in the short-distance passenger rail transport segment using the railway infrastructure operated by federally owned infrastructure managers increased by 0.8 percent between 2017 and 2018. By contrast, the revenue they generated from track access charges in this segment rose by 2.5 percent in nominal terms (by 0.7 percent when adjusted for inflation). The changeover that took place at the same time in the method used by DB Netz AG – from distance-based to demand-based input parameters – led to a situation in which the revenues from track access charges from long-distance passenger rail transport services increased sharply while the revenues generated from track access charges collected in the rail freight transport segment fell.

Another examination focuses on the development over time of spending by federally owned infrastructure managers for their

infrastructure, of transport performance and of revenue generated from track access charges.[9]

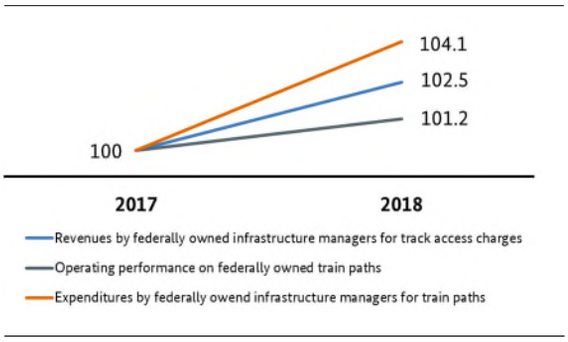


Figure 43: Development of expenditure, transport performance and revenue, generated from track access charges by federally owned infrastructure managers (2017-2018; indexed 2017 = 100)

The revenue generated by federally owned infrastructure managers from track access charges for all transport services increased by 2.5 percent between 2017 and 2018. Total transport performance increased by 1.2 percent, while the amount that the federally owned infrastructure managers expended for their infrastructure grew by an estimated 4.1 percent.

The following diagram shows the corresponding evaluation for federally owned operators of passenger stations.

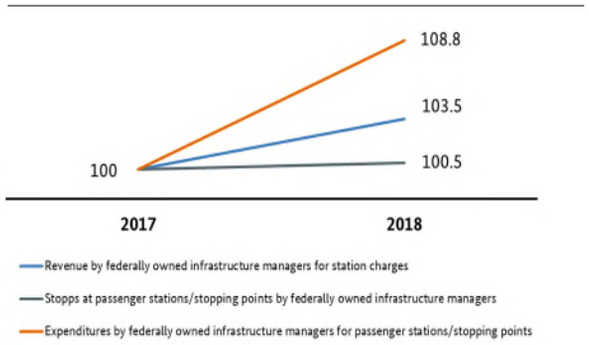


Figure 44: Development of expenditure, station stops and revenue, generated from station usage charges by federally owned operators of passenger stations (2017-2018; indexed 2017 = 100)

The diagrams below show the values that can be attributed to the short-distance passenger rail transport service segment. Expenditures here are assigned to the respective transport segment using the method developed in connection with the cost recovery assessment.

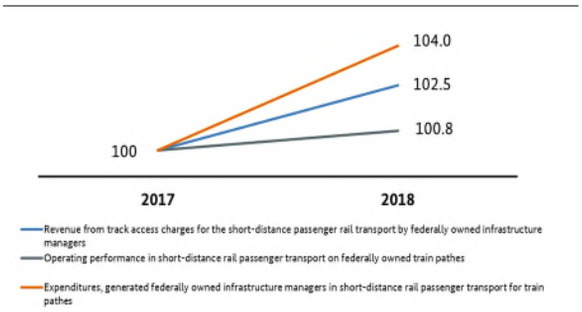


Figure 45: Development of expenditure, transport performance and revenue generated from track access charges by federally owned infrastructure managers in connection with short-distance passenger rail transport services (2017-2018; indexed 2017 = 100)

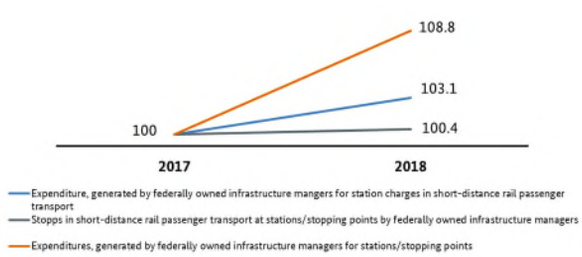


Figure 46: Development of expenditure, station stops and revenue, generated from station usage charges by federally owned operators of passenger stations in connection with short-distance passenger rail transport services (2017-2018; indexed 2017 = 100)

[9] Due to a change in the accounting system used by DB Netz AG, expenditures for 2018 were estimated on the basis of the average useful life of the fixed assets for the year 2017 so that a comparative presentation could be made.

A long-term comparison (since 2010) of the development of regionalisation funds, transport performance in the short-distance passenger rail transport segment, and the revenue generated from track access charges for short-distance passenger rail transport by federally owned infrastructure managers shows that the rate of increase in the regionalisation funds was slightly less than the rate of increase for expenditure for track access charges.

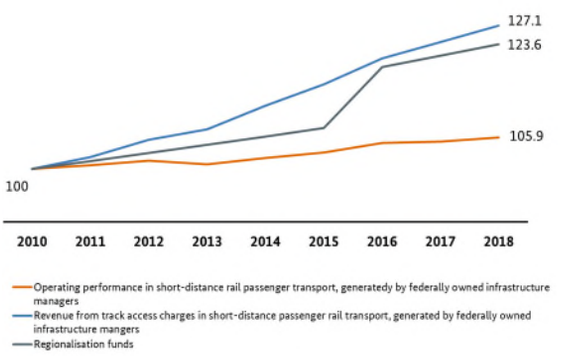


Figure 47: Development of train-parameters in the short-distance passenger rail transport segment (2010-2018; indexed 2010 = 100)

Compared to the base year – 2010 – transport services provided in the short-distance passenger rail transport segment increased by some six percent through 2018. Revenue generated from track access charges increased by approximately 27 percent in nominal terms during the same period. Adjusted for inflation, this was a rate of increase of approximately 14 percent. Regionalisation funds were increased by nearly 24 percent. After adjustment for inflation, this was just under ten percent. Particularly between 2013 and 2015, revenue generated from track access charges grew noticeably faster than the regionalisation funds. There was a significant one-off increase in the amount of regionalisation funds in 2016, which brought the two back into line with one another. It remains to be seen whether in the coming years revenues will continue to increase at a faster pace than the regionalisation funds being allocated.

The following diagram presents this development with a focus on federally owned operators of passenger stations since 2012. It shows that, overall, the regionalisation funds and the revenues generated from station usage charges paid by short-distance rail passenger transport service had similar rates of increase. The number of station stops in the short-distance passenger rail transport segment declined by nearly two percent during this time.

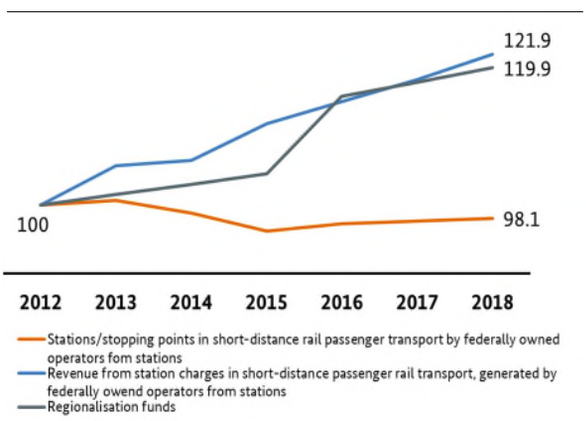


Figure 48: Development of station parameters in the short-distance passenger rail transport segment (2012-2018; indexed 2012 = 100)

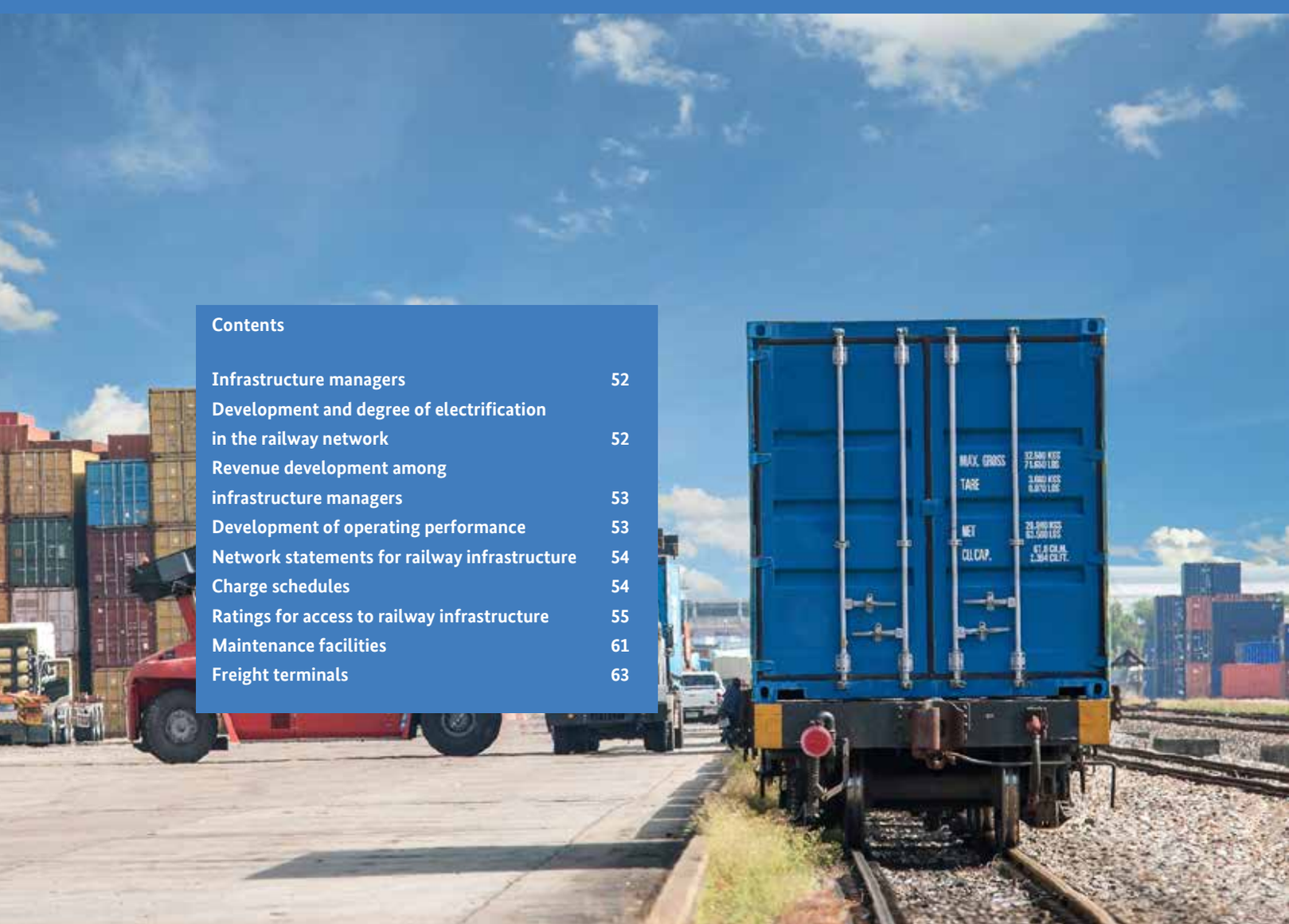
Effects increases in regionalisation funds have on infrastructure prices and on the revenues generated in the short-distance passenger rail transport segment by federally owned infrastructure managers

The provisions laid down in Section 37 of the Railway Regulation Act essentially tie the development of track access charges and station usage charges collected by federally owned infrastructure managers for short-distance passenger rail transport service to the development of the regionalisation funds. As a result, an increase in regionalisation funds directly leads to a simultaneous increase in track access charges and in large part to an increase in station charges (with the exception of agreements pursuant to Section 37 (3) of the Railway Regulation Act). In accordance with Section 5 (3) and (6) of the Regionalisation Act, regionalisation funds are currently increased by 1.8 percent a year so that the track access charges in short-distance passenger rail transport service increase by 1.8 percent a year for the relevant infrastructure managers (approximating the station charges). If the rate of change for the regionalisation funds were to change, the pricing would be adjusted immediately.

As a result of this mechanism, the revenues that federally owned infrastructure managers derive from track access charges and station charges in the short-distance passenger rail transport segment would increase in the case of, for example, an unscheduled increase in the regionalisation funds, even if the volume of traffic were to remain the same. Figure 41 shows the extent: Track access charges and station charges for federally owned infrastructure managers currently come to just under 50 percent of the regionalisation funds. This ratio can be applied to every increase in the regionalisation funds when the transport performance of the short-distance passenger rail transport segment remains the same. For example, if the regionalisation funds were to increase by €100 million, approximately €50 million would go directly to federally owned infrastructure managers as additional revenue for existing traffic in the short-distance passenger rail transport segment. Approximately €50 million would be left for the federal states to use to order additional transport service and other measures.

Provision of infrastructure

Statutory regulation in the railway sector focuses on infrastructure managers in the railway market. This regulation ensures non-discriminatory access to railway infrastructure in Germany for all railway undertakings.



Contents

Railway infrastructure market

The revenue generated by infrastructure managers rose once again in 2018. Once more, the number of train-kilometres travelled increased over the previous year.

Infrastructure managers

For its 2019 railway market survey, the Bundesnetzagentur gathered data from more than 130 infrastructure managers and more than 550 service facility operators. Nearly every infrastructure manager also operates service facilities.

There is still no central register for railway infrastructure that covers all infrastructure managers and their service facilities. To complicate things, a licence is not required to operate most service facilities. In light of this, it must be assumed that the Bundesnetzagentur does not have a comprehensive overview of the railway infrastructure market in some segments.

Development and degree of electrification in the railway network

In 2018, the railway network in Germany covered a total of 39,369 kilometres with a track length of approximately 60,000 kilometres (excluding tracks in service facilities). Tracks with a total length of approximately 11,100 kilometres are operated in service facilities.

In all, somewhat more than half of the German railway network is electrified. The electrification rate has risen continuously since 1994. However, the railway network also shrank as the result of the decommissioning of lines. Since 1994, the length of the electrified part of the network has increased by approximately 100 kilometres a year in absolute terms.

In contrast to the 60 percent electrification rate among federally owned railway line infrastructure operators, this figure is less than ten percent for non-federally owned railway line infrastructure operators. A large portion of this infrastructure is attributable to railways that operate tram and railway infrastructure. Consequently, parts of it are subject to railway law.

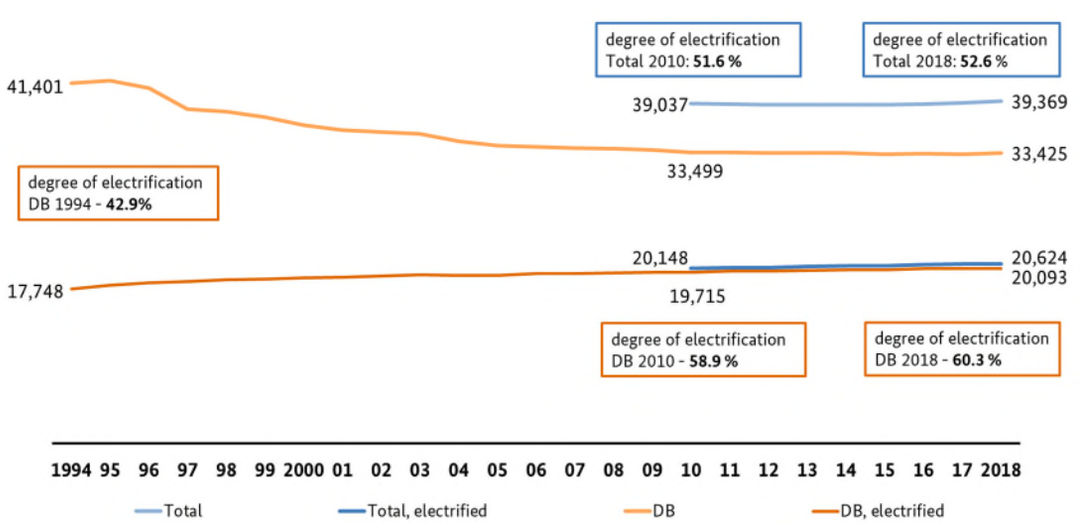


Figure 49: Development of the rail network and the degree of electrification in the rail network (1994-2018; length in kilometres; shares in percent)

Revenue development among infrastructure managers

The infrastructure managers generated their revenues primarily from the charges they collected for the use of train paths and service facilities and from external funding. At €5.3 billion, track access charges accounted for approximately 80 percent of the total revenue generated from charges for infrastructure usage in 2018. Station charges account for approximately 14 percent of total revenue; charges for the use of other service facilities are responsible for the remaining six percent.

Looking back at recent years, this represents a steady increase in the revenues generated from usage charges. Compared to 2014, parties with access entitlements had to spend approximately €800 million more for their use of railway infrastructure in 2018. This places the average annual rate of increase at about three percent.

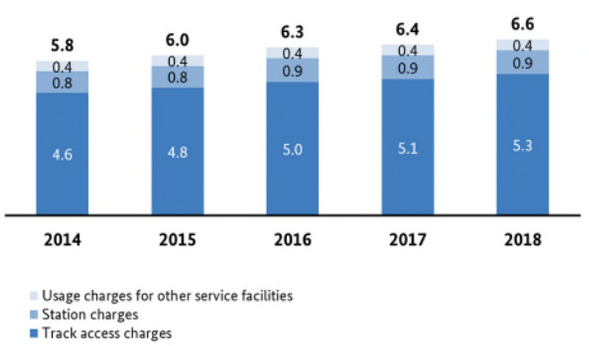


Figure 50: Revenues generated from usage charges in the railway infrastructure market (2014-2018; in billions of euros)

Looking at the entire railway market, the short-distance passenger rail transport segment accounts for approximately two-thirds of the track access charges. Nineteen percent of the track access charges were paid for services in the long-distance passenger rail transport segment; more than 14 percent were paid for services provided in the freight rail transport segment. The shares of the individual transport services remained virtually unchanged over the period under review.

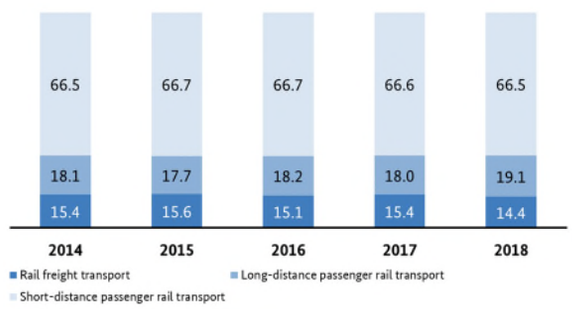


Figure 51: German infrastructure managers' total revenues from track access charges, broken down by type of service (2014-2018; in percent)

Development of operating performance

The number of kilometres travelled in Germany's public railway network increased once again during the reporting period. The year's total of 1,115 million train-kilometres set a new record.

Increases were reported for all three types of transport service in 2018. The amount of transport services provided by railway undertakings increased over the previous year, not only for rail freight transport but also for long-distance passenger rail transport and short-distance passenger rail transport.

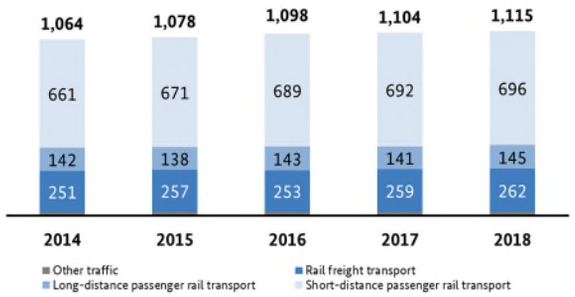


Figure 52: Development of train-kilometres, broken down by type of service (2014-2018; in millions of/million train-kilometres)

Non-federally owned railway infrastructure was used for less than three percent of the train-kilometres travelled. The other 97 percent of the transport services used the line infrastructure operated by infrastructure managers belonging to DB Group. These infrastructure managers account for some 85 percent of the total length of railway lines operated in Germany. The average traffic density is thus significantly lower on non-federally owned railway infrastructure, making it more difficult to establish track access charges that not only cover costs but are at the same time marketable.

Network statements for railway infrastructure

All infrastructure managers are required by law to provide all parties with access entitlements access under non-discriminatory terms and conditions to the infrastructure they operate.

Under certain circumstances however, the Railway Regulation Act which went into force in September 2016 allows for limiting free access, such as in the area of factory railways (Section 15 of the Railway Regulation Act) when the respective infrastructure is deemed to be of little or no competitive importance.

Infrastructure managers are additionally required to issue terms of use for the railway infrastructure they operate. Depending on the type of infrastructure being operated, this obligation involves issuing a network statement and/or service facilities statement. There are exceptions to this, such as for factory railways and non-standard-gauge railways. As in the past, the Bundesnetzagentur can, upon request, issue an exemption from this requirement when certain conditions are fulfilled. Approximately one-fourth of all infrastructure managers have been exempted from the requirement to issue a network statement. This group includes operators of non-standard-gauge railway infrastructure. To date, 14 percent of the service facility operators have been exempted from the requirement to issue a service facilities statement.

Before they can go into effect, the Bundesnetzagentur reviews the access requirements to ensure their conformity with the law; they take effect only after the Bundesnetzagentur confirms they fulfil the legal requirements.

In 2019, 96 percent of the railway line infrastructure operators and 60 percent of the service facility operators had published network statements or service facilities statements. This is due to the fact that more service facility operators have become known to the Bundesnetzagentur.

Infrastructure managers that have been exempted from the requirement to draw up network statements have not been included in the shares calculated here. Of the remaining companies, some are still in the process of drawing up their network statement or the exemption procedure has not yet been completed.

The Bundesnetzagentur continues to encourage infrastructure managers to draw up in a timely manner network statements hat are in conformity with the law.

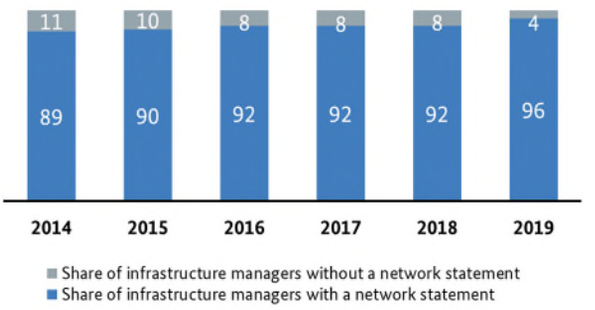


Figure 53: Share of infrastructure managers that have published a network statement (2014-2019; shares in percent)

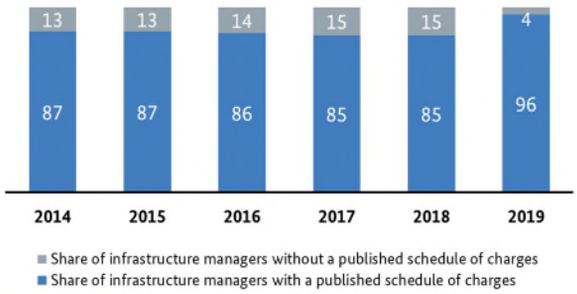


Figure 54: Share of infrastructure managers that have published schedules of their charges (2014-2019; shares in percent)

Charge schedules

Infrastructure managers are required by law to draw up and publish schedules of their charges for the use of their infrastructure. Service facility operators are likewise required to draw up schedules of their charges. The law does however also allow for exceptions.

A total of 96 percent of the infrastructure managers have drawn up and published corresponding schedules of their charges as required by law, significantly more than in the previous year. One factor that has contributed to this is the Bundesnetzagentur's systematic review which it conducts as part of its charge approval procedure.

However, the share of service facility operators that have drawn up schedules of their charges was just 58 percent in 2019. This was due to the fact that the Bundesnetzagentur has recently become aware of further service facility operators.

Ratings for access to railway infrastructure

As part of its regular market survey, the Bundesnetzagentur gives all parties with access entitlements the opportunity to evaluate and rate market-related aspects on a scale of 1 (very good) to 5 (unsatisfactory). In addition, the Bundesnetzagentur also surveys the regional transport authorities that task railway undertakings with providing transport services in the short-distance passenger rail transport segment. The market findings for the regional transport authorities are summarised in the chapter "Regional transport authorities and the short-distance passenger rail transport market".

Average values are calculated on the basis of the estimates provided by parties with access entitlements. Using these figures, it is possible to conduct comparisons with other topics and generate time series.

There have not been any major changes in most areas for several years now.

Once again, the highest ratings went to the areas which are regulated by the Bundesnetzagentur and to the infrastructure managers' perceived customer friendliness. The parties with access entitlements taking part in the survey assigned the best ratings for "non-discriminatory pricing systems", "access to service facilities" and "access to train paths".

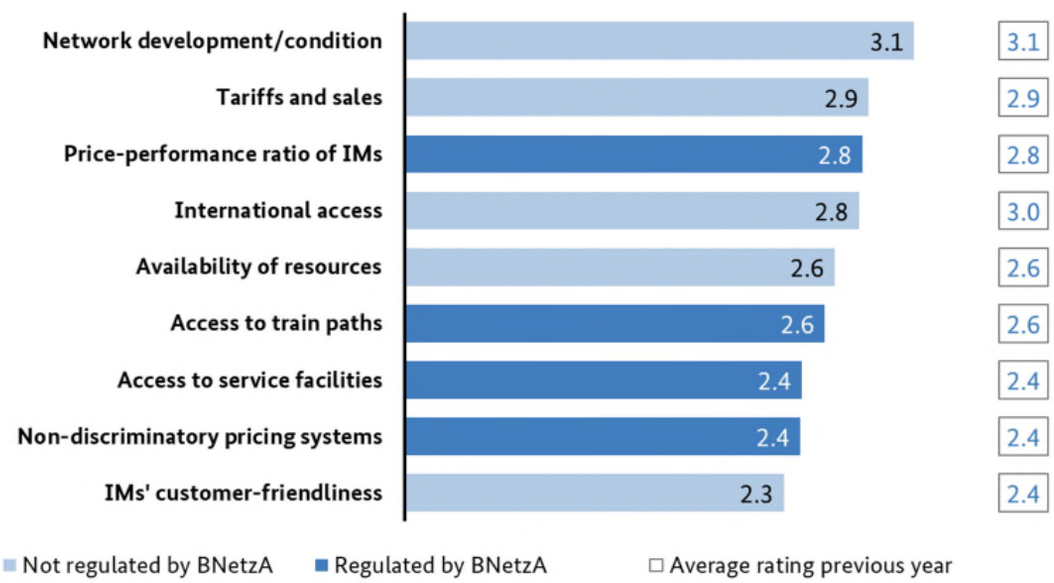


Figure 55: Factors that influence the railway market (2019; average values)

As in the preceding years, the infrastructure managers' price-performance ratio was given only a "satisfactory" – 2.2 – rating. Most of the criticism from the railway undertakings focused on the unregulated areas "network development /condition" (3.1) and "tariffs and sales" (2.9). The rating assigned for "international access" to railway infrastructure has improved markedly in recent years. This area received a rating of 3.3 from parties with access entitlements in 2015. By contrast, this group now rates it with a 2.8.

The railway undertakings gave the best ratings on average in the "access to train paths" area to the "allocation of scheduled train paths" (2.4) and the "allocation of ad hoc train paths" (2.3).

The market participants surveyed were less satisfied with "construction planning", "network condition" (both 3.1) and "network development" (3.2).

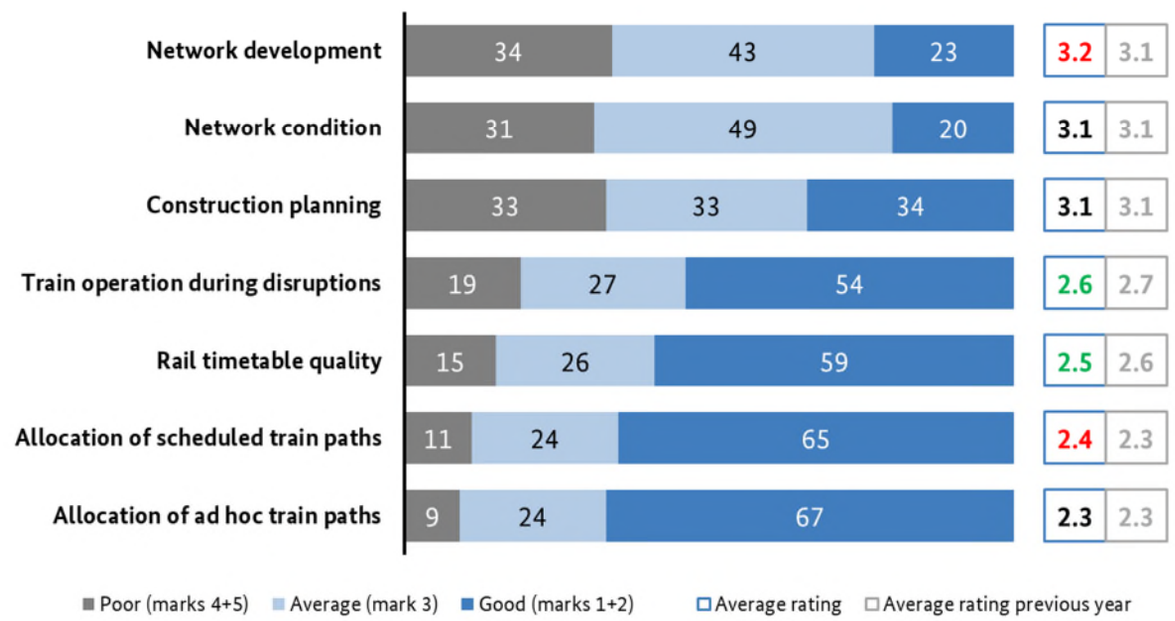


Figure 56: Ratings given for track access (2019; rating shares in percent and average marks)

By contrast, more than half of the railway undertakings taking part in the survey rated dispatching during disruptions as “good” or “very good”. Nonetheless, in the comments and tips they provided, many railway undertakings included criticism of the scheduling of traffic in individual cases (see the chapter "Railway Transport Market").

Generally speaking, however, there have been no significant changes in the ratings the railway undertakings have given to the area “track access” in recent years.

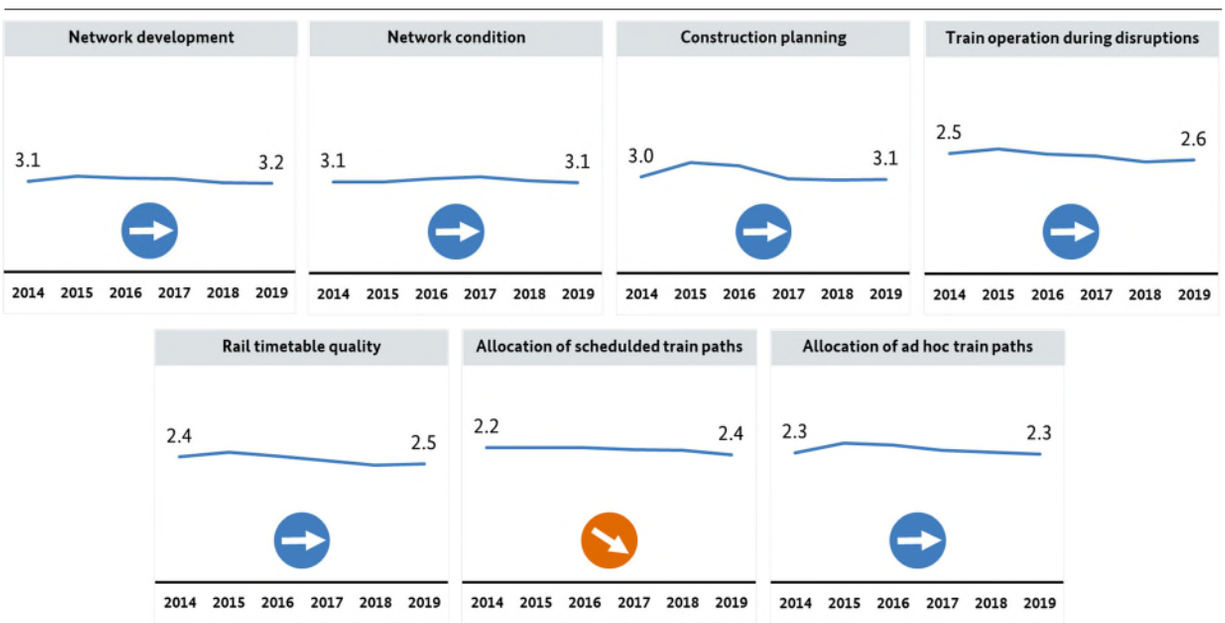


Figure 57: Trends in the ratings given for areas pertaining to train paths (2014-2019)

With the exception of the area of railway sidings, “access to service facilities” received positive ratings during the current reporting period.

The only area to be rated with just “satisfactory” was “access to railway sidings” (2.9). Approximately one-third of the railway undertakings (29 percent) even rated “access to railway sidings” as “poor” or “unsatisfactory”. The respondents particularly criticised the insufficient availability of leasable capacity.

The areas “refuelling facilities” and “passenger stations/stopping points” both received the best ratings: 2.2. Approximately three out of every four participating railway undertakings rated access to these facilities as good or very good.

Access to other types of service facilities was also rated as good or very good by more than 50 percent of the parties with access entitlements.

By contrast, parties with access entitlements expressed an above-average amount of criticism of the condition and level of modernisation of passenger stations. The railway undertakings’ ratings – 2.8 for the condition of passenger stations and 2.7 for the level of modernisation of passenger stations – were significantly more negative than for access-related areas that are regulated by the Bundesnetzagentur.

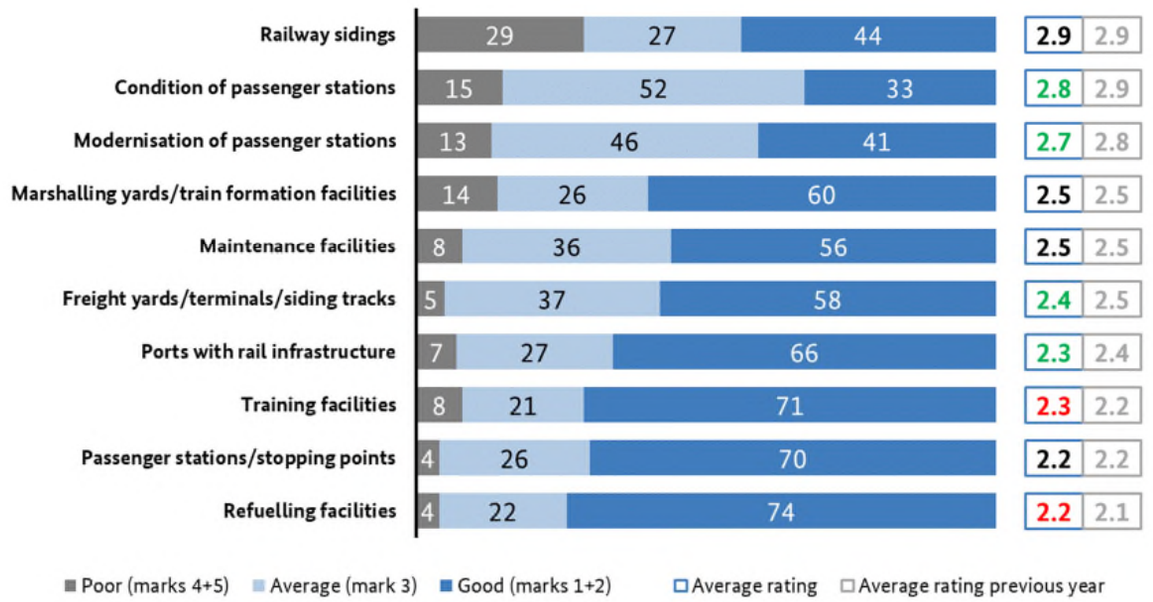


Figure 58: Ratings given for access to service facilities (2019; rating shares in percent and average marks)

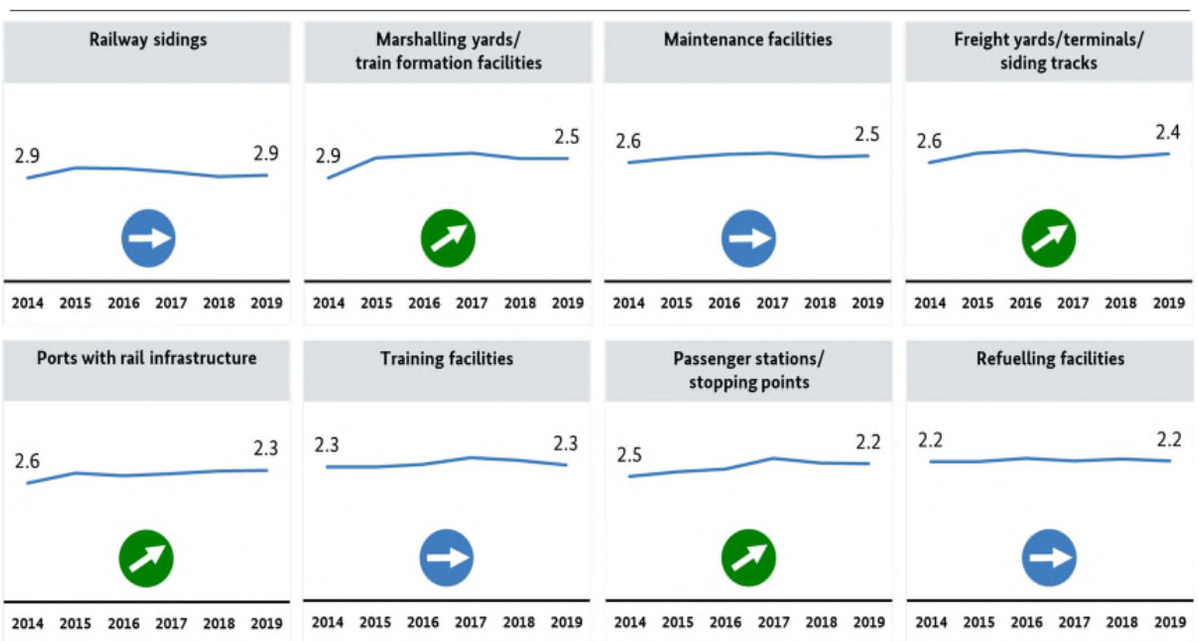


Figure 59: Trends in the ratings given for areas pertaining to service facilities (2014-2019)

Maintenance facilities

Regular maintenance is of crucial importance for the safe and reliable operation of rolling stock. Maintenance services are provided in maintenance facilities which are classified as service facilities or, particularly when the work to be done involves straightforward tasks, are provided on site.

In compliance with the task set forth in Sections 64 and 65 of the Railway Regulation Act, the Bundesnetzagentur examined the area of maintenance facilities in detail. The findings were published in the form of a draft report and consultations on them were held. Further information is available at: www.bundesnetzagentur.de/werkstattstudie

An extensive market survey was conducted as part of this analysis. In 2017, 183 infrastructure managers operated 325 maintenance facilities in Germany. The recorded volume of the maintenance and repair services provided totalled approximately €2.75 billion. This figure includes some €2.25 billion in services that were provided as in-house production in the company or company group, while approximately €0.5 billion were spent on maintenance contracts with third parties (outsourced production).

Federally owned railway undertakings operated approximately one-third of the maintenance facilities. These facilities however were responsible for some €2.1 billion in revenue, three-fourths of the total revenue generated by maintenance facilities. A large share of the maintenance services was provided through in-house production. Non-federally owned railway undertakings operated approximately two-thirds of the maintenance facilities. However, at €0.6 billion, they generated only one-fourth of the total revenue generated by maintenance facilities. There was more outsourced production than in-house production in these facilities.

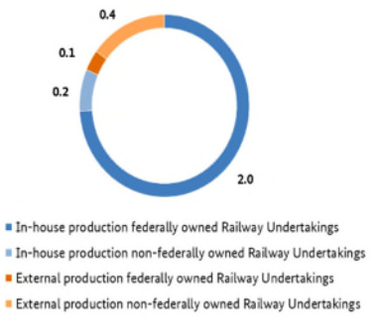


Figure 60: Volume of maintenance services (2017; in billions of euros)

Most maintenance facilities are operated by undertakings that are also railway undertakings or leasing companies for rolling stock. In addition, independent operators and rolling stock manufacturers also provide maintenance services for customers.

The Bundesnetzagentur asked for each maintenance facility which services they provided in 2017 (multiple answers allowed). Approximately one out of every two maintenance facilities provided services as part of on-site maintenance in the short-distance passenger rail transport segment. This corresponds to some €800 million in revenue. Approximately one out of every three maintenance facilities serviced and repaired freight cars (revenue: some €350 million). Maintenance services for diesel locomotives were another focus of activity (on-site services are provided by approximately 40 percent of the maintenance facilities and account for some €110 million in revenue; heavy maintenance is performed by approximately 25 percent, generating around €90 million in revenue). Significant revenues totalling several hundred million euros were also reported to the Bundesnetzagentur for maintenance services performed on multiple train units used in the long-distance passenger rail transport segment. These services were provided in a handful (less than ten) of maintenance facilities.

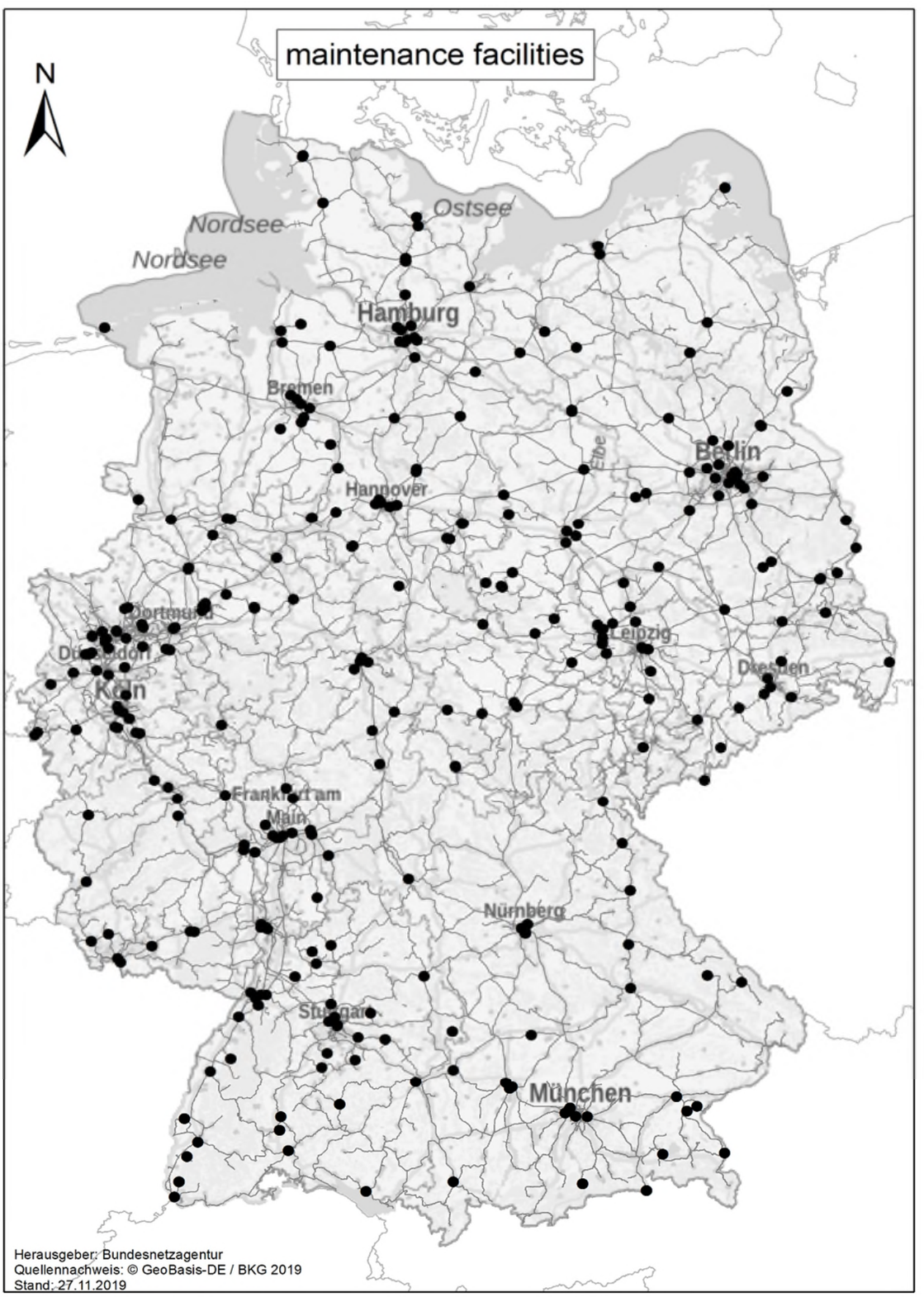


Figure 61: Maintenance facilities in Germany

Freight terminals

Operators are required to grant access to service facilities and the services they provide. These service facilities include freight terminals, with their loading platforms and access ways for freight, including access roads.

Based on information now available to the Bundesnetzagentur, there are more than 400 loading terminals and load transfer points, approximately 200 conventional freight terminals, more than 110 freight terminals for combined rail/road transport services, and more than 100 trimodal terminals.

Most of these terminals are located in the state Lower Saxony (more than 130), followed by Bavaria with more than 120 locations and North Rhine-Westphalia with approximately 100 locations.

In many cases, freight terminals are not owned and operated by the same company. In addition, at many locations the trackage and the transhipment facilities are operated by different companies. In such cases, customers often pay two different charges: for their use of the track system and for transhipment.

Only a few companies reported that their freight terminal is located on one of the European Union's rail freight corridors. Most of the terminals are located on Rail Freight Corridor 8 (North Sea – Baltic), followed by Rail Freight Corridor 3 (Scandinavia – Mediterranean).

The Bundesnetzagentur does not yet have a complete picture of the railway market with regard to the operators and owners of the freight terminals and trackage. In light of this, it will include more undertakings in its next market surveys in order to obtain an even more complete overview of the market.

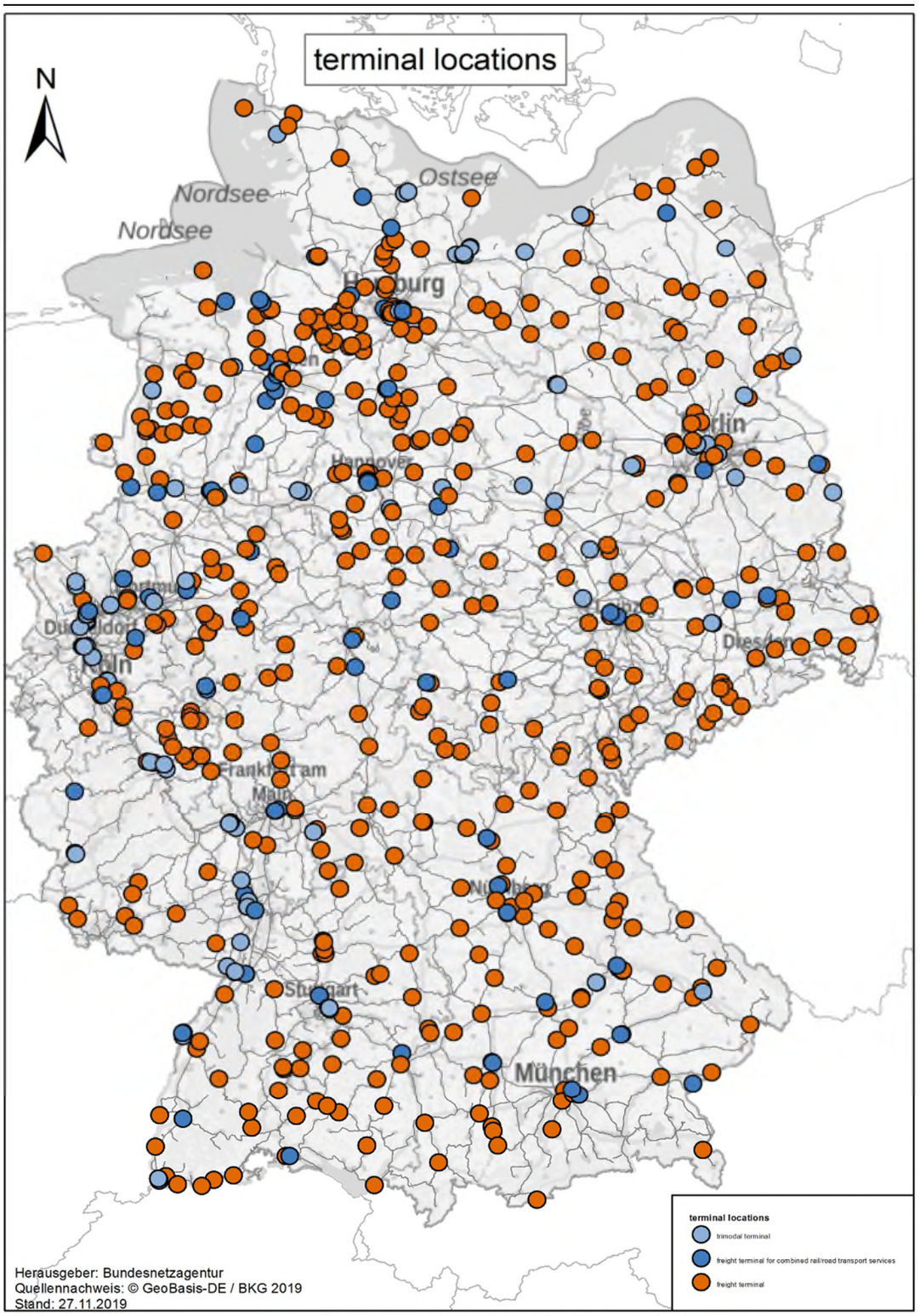
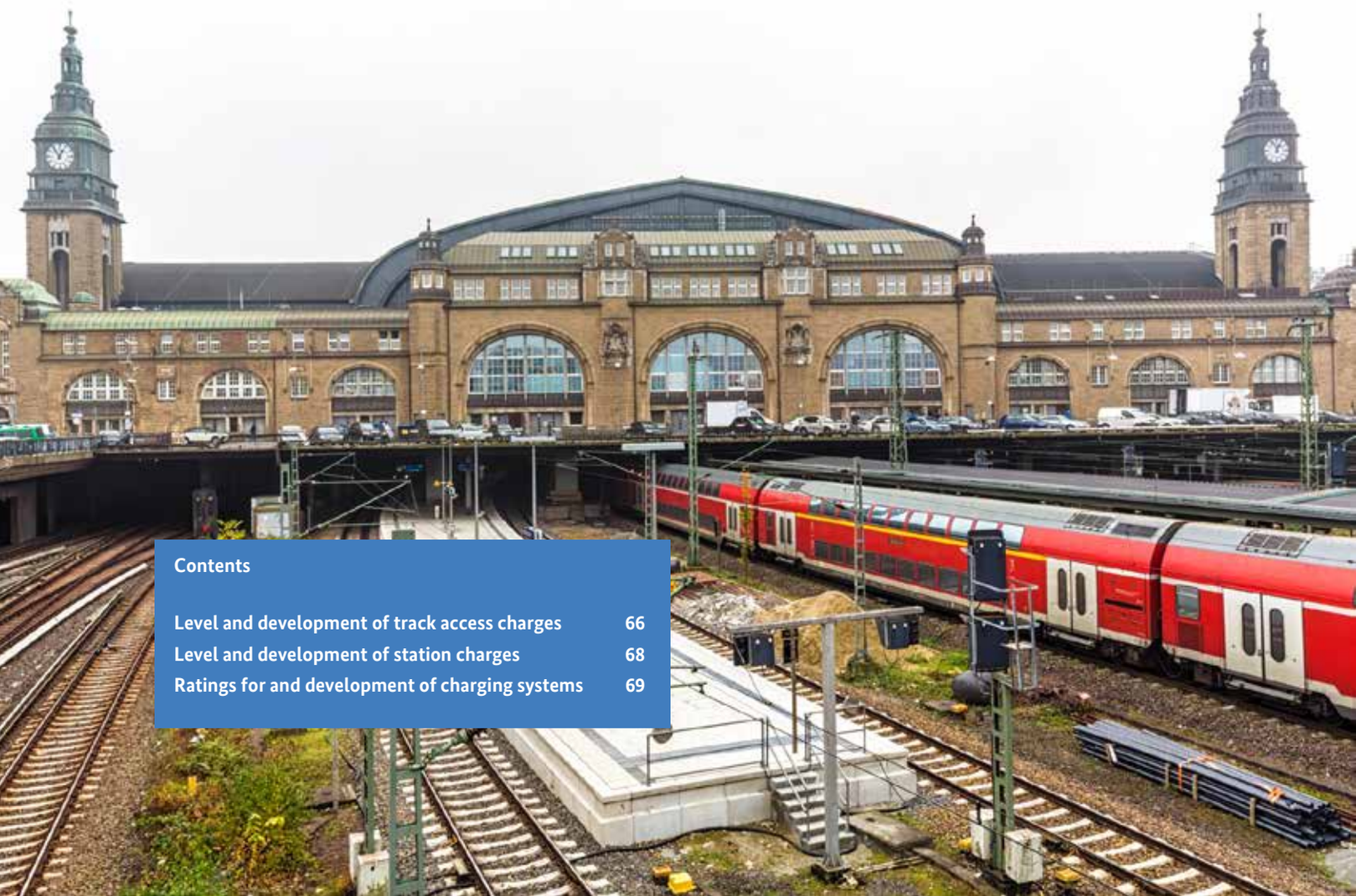


Figure 62: Terminal locations in Germany (2018)

Price trends

Operating within its statutory framework, the Bundesnetzagentur reviews the charges railway undertakings have to pay infrastructure managers for the provision of railway infrastructure.

The following chapter examines these charges from the market perspective.



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Charges for the use of infrastructure

The steady rise in track access and station usage charges is substantially affecting the cost-effectiveness of railway undertakings' business operations.

Infrastructure managers incur costs in connection with the operation and maintenance of their infrastructure. They pass these costs on – in the form of infrastructure charges – to railway undertakings and other parties with access entitlements when they use this infrastructure. Given that railway undertakings spend approximately one-third of their revenue on usage charges across the entire market, the level of these charges represents one of their largest cost factors.

The Bundesnetzagentur is required by law to monitor and approve, within the framework of currently applicable legal or regulatory provisions, the infrastructure managers' pricing systems. Overall, in many cases it has been possible to bring about improvements to the benefit of parties with access entitlements. Reliable, non-discriminatory access rules and usage charges that are viable in the market are essential factors for ensuring that rail transport can hold its own in the face of intensive intermodal competition.

Level and development of track access charges

As a rule, track access charges payable to infrastructure managers must be based on the costs incurred in connection with operating and maintaining the track infrastructure. These charges can vary greatly, depending on the operating density and general condition of the railway infrastructure. In addition, maintenance measures (such as bridge restoration) can in the longer term have a strong influence on the level of usage charges. Important cost factors include not only the usage profile, age, level of modernisation, and condition of the railway infrastructure but also topographical features (bridges/tunnels, costly routing).

Public funding accounts for a significant part of the financing of the transport infrastructure in Germany. Consequently, in the case of necessary infrastructure measures, for example, public funding can be the factor that decides whether the railway infrastructure continues to exist.

Financial support also benefits railway undertakings. For example, track access charge assistance[10] went into effect for the freight rail transport segment on 1 July 2018. This assistance meant approximately €350 million per calendar year for the railway undertakings operating in this segment.

The weighted arithmetic mean of the track access charges that infrastructure managers levied in 2018 was €4.70 per train-kilometre.[11] This was approximately one percent more than in the previous year. The median was somewhat higher at €4.99 per train-kilometre.

[10] This track access charge assistance pertains only to the charges of DB Netz AG/DB RegioNetz Infrastruktur GmbH.

[11] Not taking into account the €164 million in track access charge assistance paid in the freight rail transport segment during the second half of 2018.

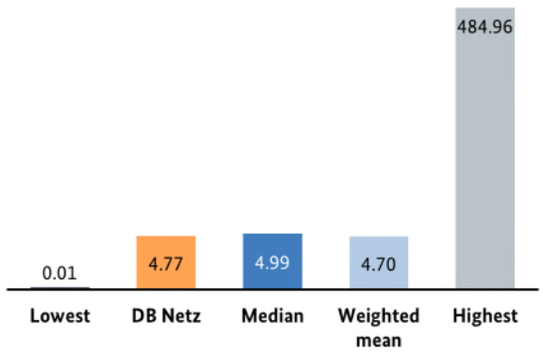


Figure 63: Range of the average track access charges (2018; euros per train-kilometre)

The track access charges of non-federally owned infrastructure managers whose infrastructure is used primarily or exclusively for rail freight transport are often significantly higher than the average. In some cases, the amount to be paid per train-kilometre is considerably higher than €40. The primary reason for this is the generally lower utilisation rates for these train paths, but also the greater wear caused by the generally heavier trains.

The average amount being charged for track access has steadily increased over the last five years. Between 2014 and 2018, the track access charges railway undertakings had to pay increased by an average of approximately 17 percent in the long-distance passenger rail transport segment, and by eight percent in the short-distance passenger rail transport segment. These increases are markedly higher than those for important benchmark indicators such as the consumer price index or the producer price index for industrial products.

The typical cost structure of an infrastructure manager can be reproduced more precisely by using a combination of publicly available indices of the Federal Statistical Office rather than indices designed for universal use.

The "infrastructure managers' input price index" posted a year-on-year increase of five percent, once again following the development of the consumer price index relatively closely.

Track access charges in the short-distance passenger rail transport segment averaged €4.99 per train-kilometre in 2018. Track access charges in the long-distance passenger rail transport segment were significantly higher. Here the average charge was €6.88 per train-kilometre. In the rail freight segment, railway undertakings had to pay an average of €2.87 per train-kilometre (without adjustment for track access charge assistance). When track access charge assistance is taken into consideration, the average track access charge was €2.25 per train-kilometre.

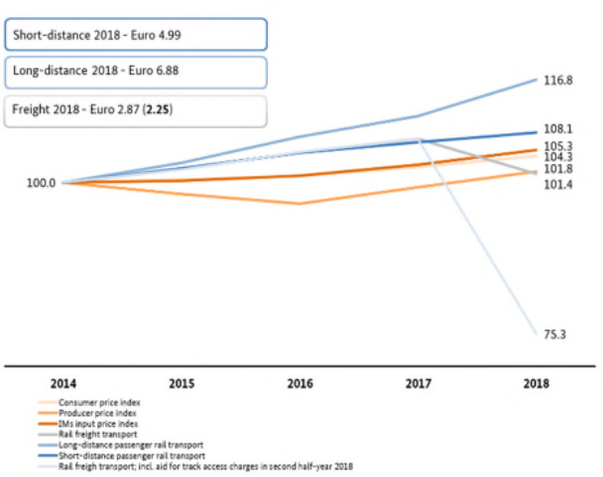


Figure 64: Development of the infrastructure managers' average track access charges with track access charge assistance in the freight rail transport segment starting the second half of 2018 (2014-2018; indexed 2014 = 100)

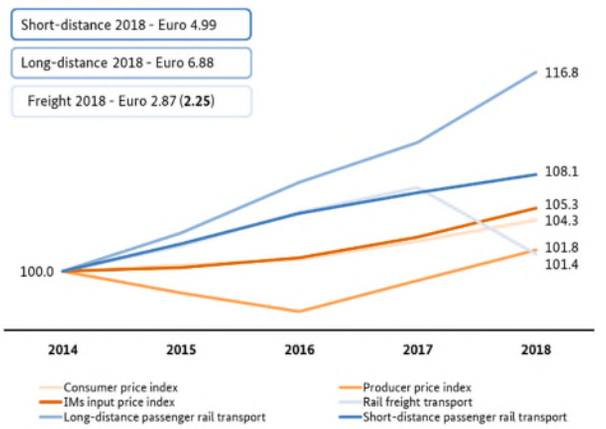


Figure 65: Development of the infrastructure managers' average track access charges (2014-2018; indexed 2014 = 100)

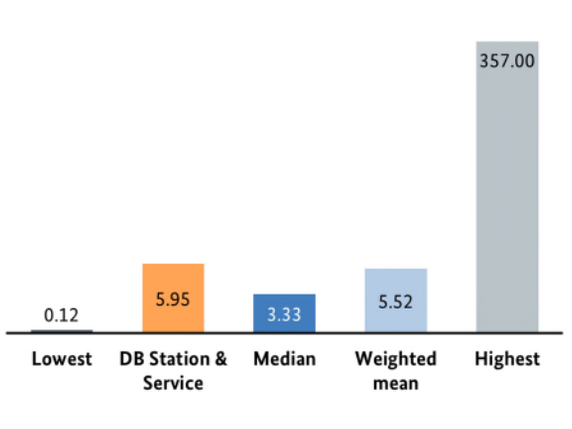


Figure 66: Range of average station charges (2018; euros per station stop)

Level and development of station charges

In 2018, operators of passenger stations charged an average of €5.52 for a train stop in the rail passenger transport segment with passengers boarding and alighting. At just €3.33 per station stop, the median is considerably lower because many of the smaller operators of passenger stations charge parties with access entitlements lower rates per station stop. Many non-federally owned operators of passenger stations run basic stations. DB Station&Service AG on the other hand also operates significantly larger train stations with more extensive features and facilities. Correspondingly, its average station charge (€5.95) is somewhat higher than the overall average and markedly higher than the median.

Between 2014 and 2018, the charges for train stops at passenger stations increased slightly more than the consumer price index and the infrastructure managers' input price index did during the same period.

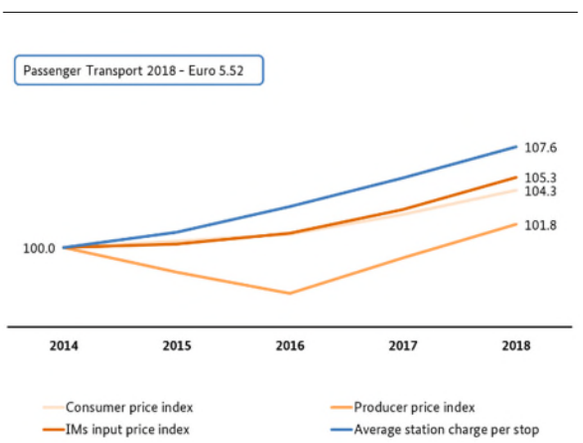


Figure 67: Development of infrastructure managers' average station charges (2014-2018; indexed 2014 = 100)

Ratings for and development of charging systems

As part of the Bundesnetzagentur's annual market survey, railway undertakings are not only asked quality-related questions regarding access to railway infrastructure, but also receive the opportunity to rate the level of non-discrimination and price performance of the infrastructure managers' charging systems.

The railway undertakings all gave the infrastructure managers' price-performance ratio satisfactory ratings.

Railway undertakings see the greatest deficits in terms of prices charged relative to the services provided in the area passenger stations/stopping points, where they assigned a rating of 3.1.

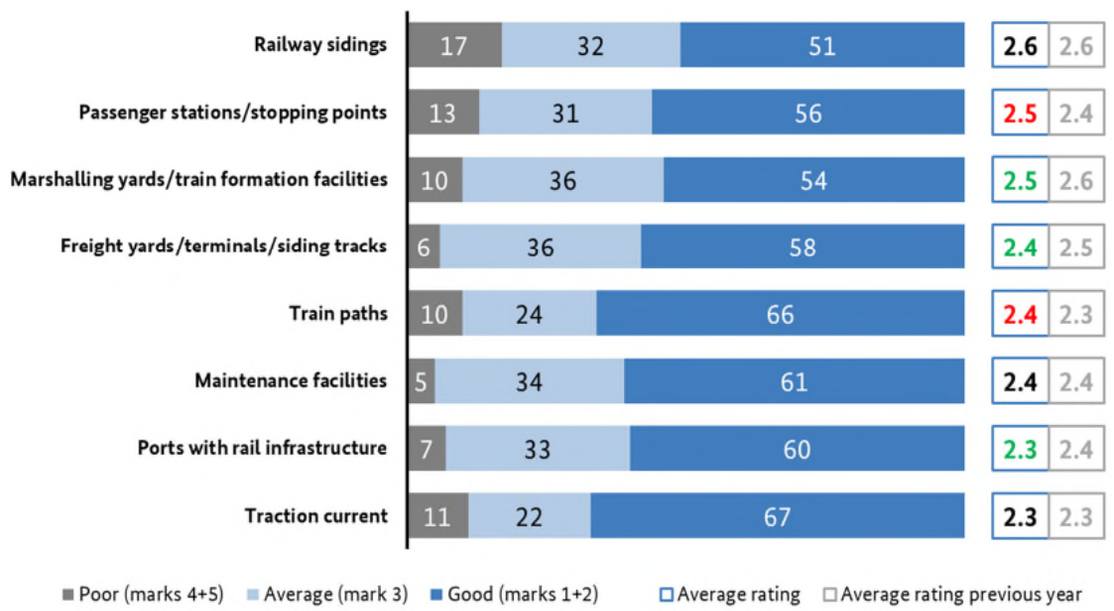


Figure 68: Ratings given for the level of non-discrimination in infrastructure managers' charging systems (2019; rating shares in percent and average marks)

All in all, the subject cluster relating to "non-discrimination in pricing systems" has consistently received above-averages ratings for several years now. Particularly when compared to the early days of regulation, the general conditions have changed considerably in favour of parties with access entitlements.

The best ratings were assigned to the pricing systems for ports with railway infrastructure and for traction current (each receiving 2.3).

Viewed over a longer period, the ratings for price performance have, in many cases, improved gradually only in recent years. In this area however, parties with access entitlements continue to see those points that are subject to regulation as having the greatest potential for improvement.

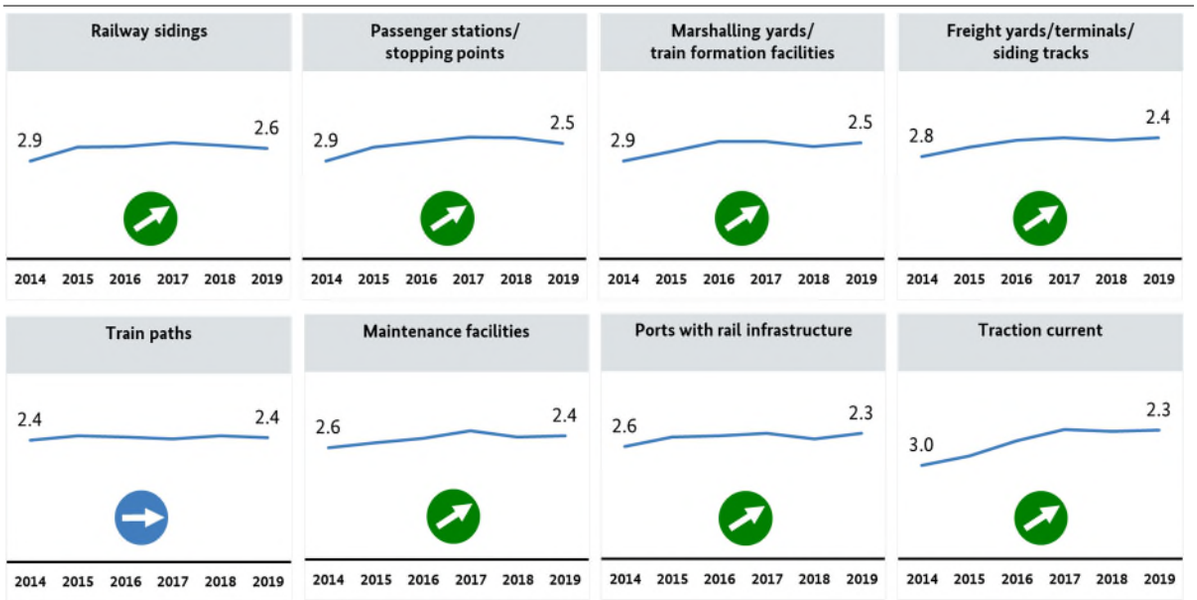


Figure 69: Development of the ratings for the level of non-discrimination in the infrastructure managers' charging systems (2014-2019)

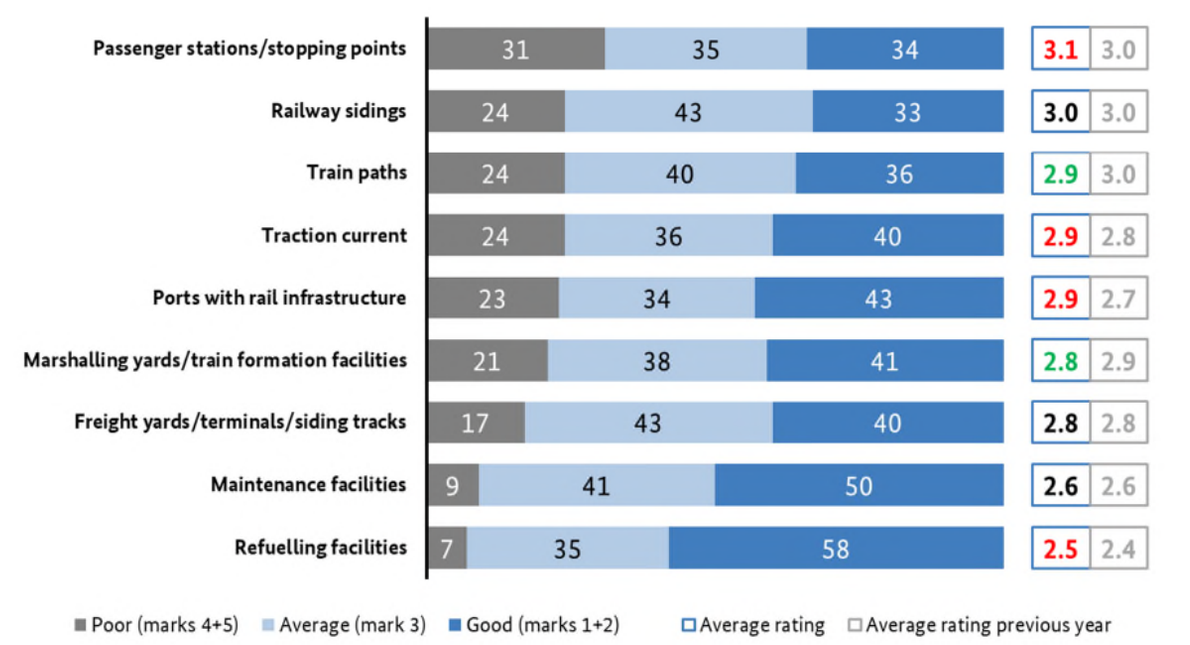


Figure 70: Infrastructure managers' price-performance ratio (2019; rating shares in percent and average marks)

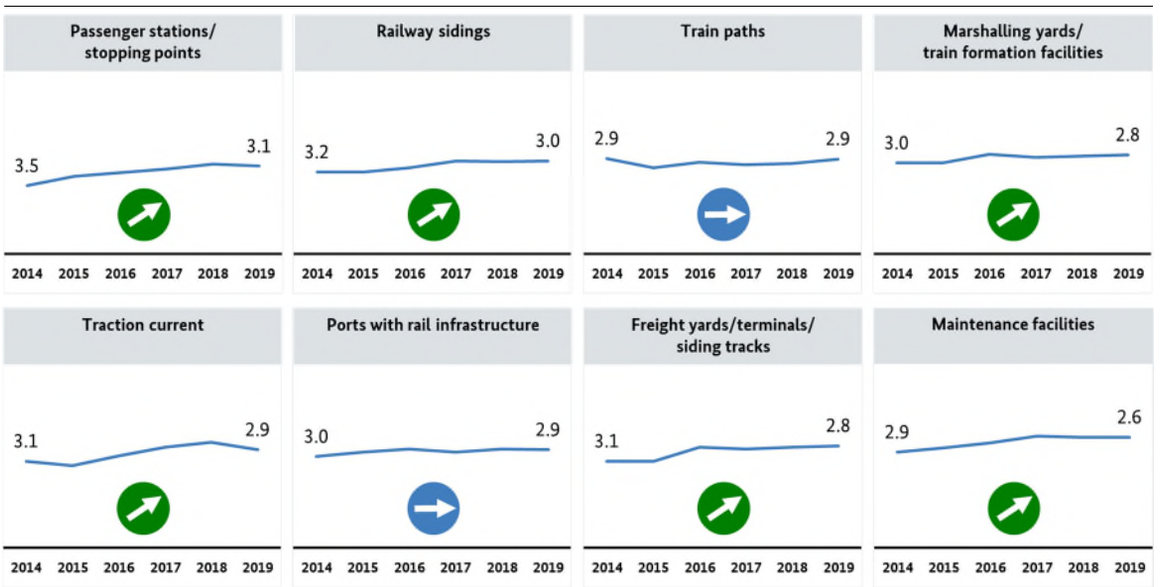
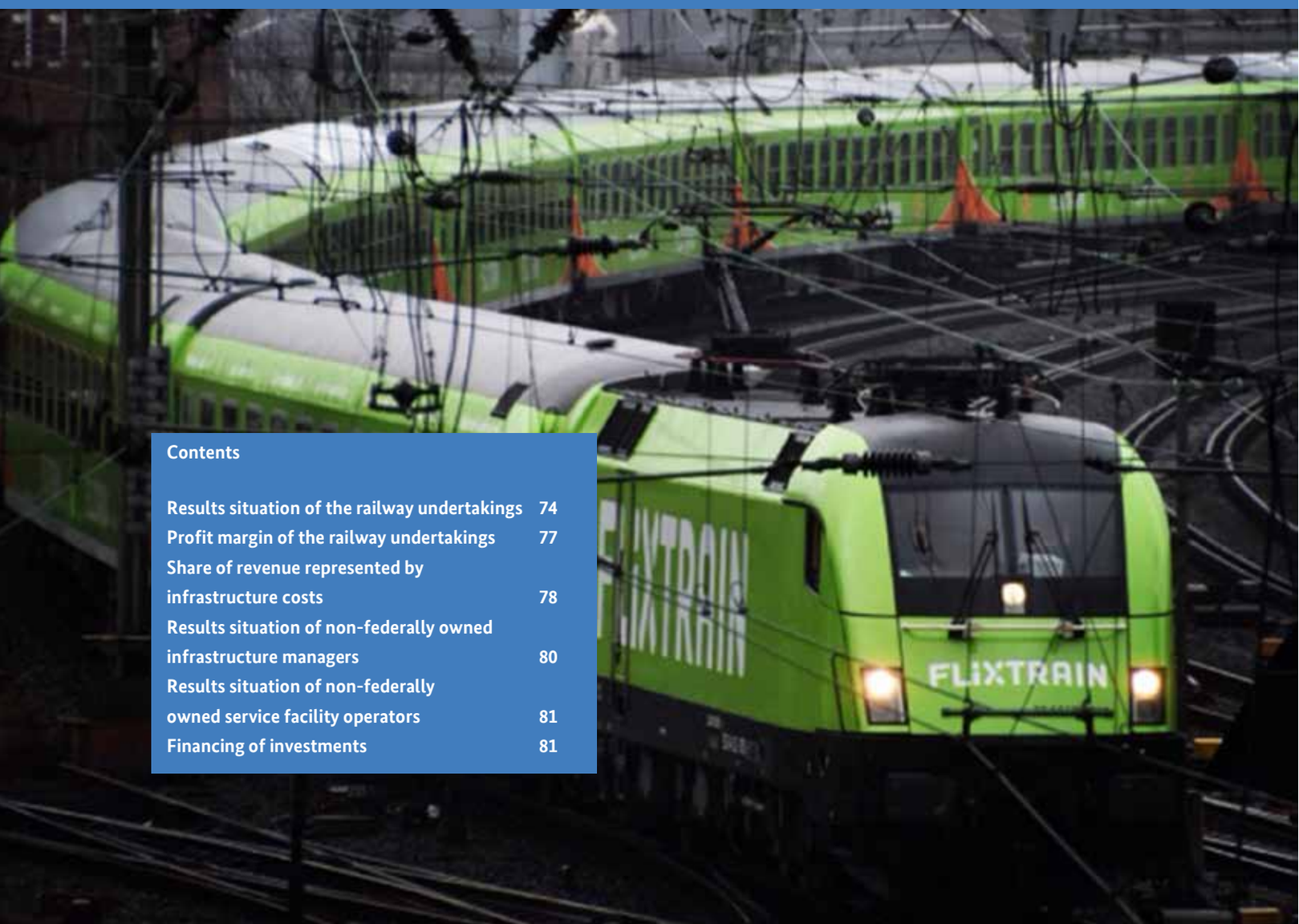


Figure 71: Development of the ratings of the infrastructure managers' price-performance ratio (2014-2019)

Cost development and results situation of the railway undertakings

The Bundesnetzagentur monitors the economic situation of enterprises operating in the railway market. As part of these activities, it examines company-specific developments and developments over specified periods of time.



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Economic situation of enterprises operating in the railway market

In 2018, the economic situation of companies operating in the railway market deteriorated over the previous year.

The Bundesnetzagentur has asked railway undertakings and infrastructure managers every year since 2012 to provide it business information which it then compiles and presents for the previous three years. For these analyses, the Bundesnetzagentur uses only the feedback it receives and conducts a plausibility check on it. It should be noted however that not all railway undertakings had completed their annual financial statements before the date on which the market survey was conducted. For the analyses of specific individual segments, only those undertakings that operate exclusively in the particular segment were included in the calculations.

Results situation of the railway undertakings

A total of 76 percent of the railway undertakings surveyed reported positive operating results for the year 2018. This represents a decline over the previous year's 79 percent. Thus, one-fourth of the railway undertakings did not generate enough revenue to cover their costs in their core business during the reporting year.

However, a closer look at the chart below reveals marked differences in the individual transport services. The situation for enterprises in the short-distance passenger rail transport segment is particularly striking. Approximately 63 percent of these undertakings reported positive operating results. This share has grown over the last several years and increased between 2016 and 2018.

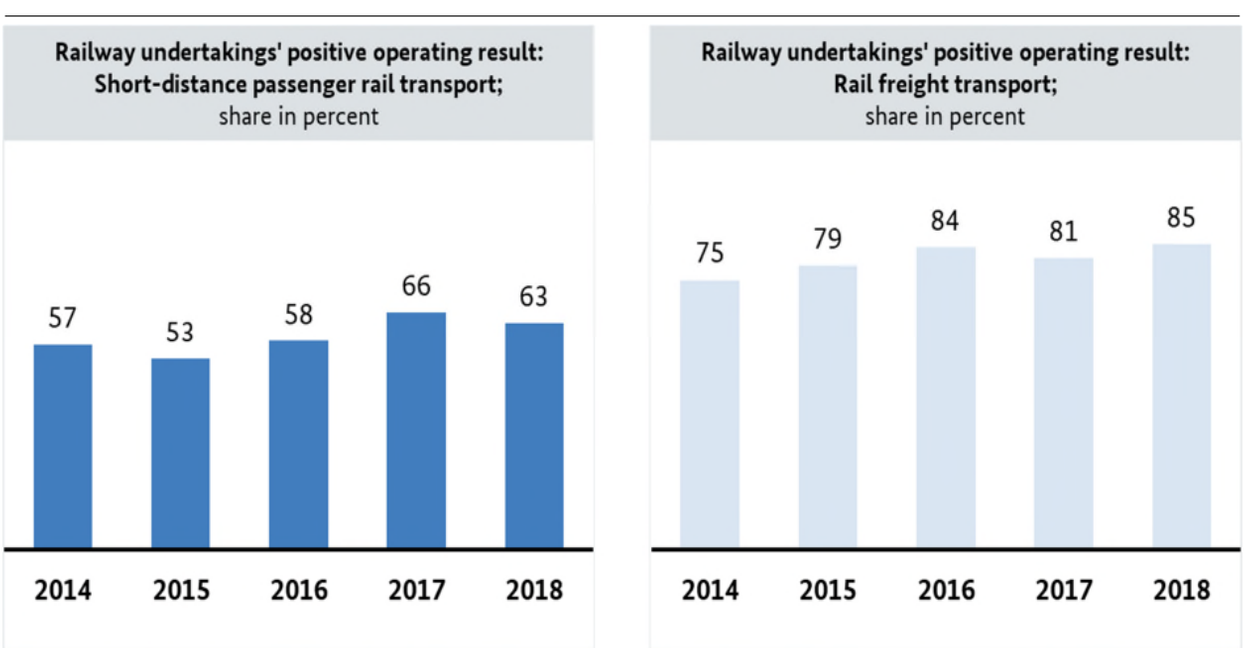


Figure 72: Market overview of railway undertakings' operating results in short-distance passenger rail transport and rail freight transport (2014-2018; shares in percent)

Based on train-kilometres travelled, these 63 percent of the undertakings account for 87 percent of the market. This also includes all federally owned enterprises. Unfortunately, a number of larger competitors were unable to generate a positive result in their core business segment.

The situation was different in the rail freight transport segment. Here, 85 percent of the enterprises generated positive results, a renewed increase over the previous year. However, enterprises that produced positive results accounted for only 41 percent of the train-kilometres travelled. For this reason, when all railway undertakings are taken into account, the rail freight transport segment reported a negative overall operating result.

The stagnation seen in the overall market situation is reflected in the range of the individual operating results. The best positive operating result in 2016 was €397 million. The best operating result in the 2017 reporting year fell again slightly to €381 million and then rose again in 2018 to €393 million. The maximum loss was -€341 million. In the previous financial year, this figure had been -€278 million. Despite the large range in the individual results, the average profit calculated on the basis of all enterprises – €8 million – and the average loss – -€9 million – changed only slightly over the previous year.

All in all, it can still be said that the enterprises' economic situation is acceptable. Looking at all the railway undertakings and types of transport services examined in this study, the overall operating result was positive. However, federally owned enterprises accounted for 83 percent of the positive operating results.

To provide a better basis for comparing the results situation in the individual transport segments, the operating results were placed in relation to a measure of performance. Train-kilometres and passenger-kilometres (short-distance passenger rail transport, long-distance passenger rail transport) and tonne-kilometres (rail freight transport) were used as the respective unit of measure.

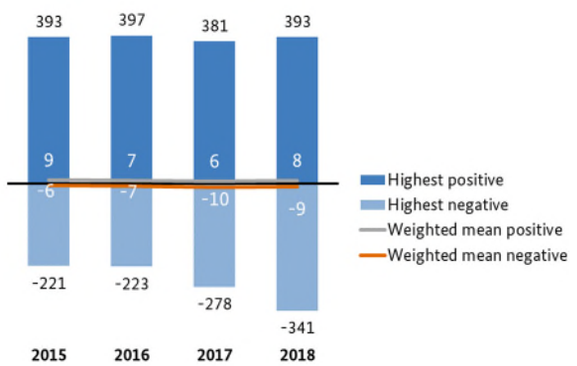


Figure 73: Range of railway undertakings' operating results (2015-2018; in millions of euros)

The result per passenger-kilometre in the short-distance passenger rail transport segment increased to 1.02 cents per passenger-kilometre last year. By comparison, the result per passenger-kilometre in 2017 was 0.97 cents per passenger-kilometre.

Looking at train-kilometres travelled, the long-distance passenger rail transport segment generated a result of €2.76 per train-kilometre in 2018, once again more than the results in the short-distance passenger rail transport segment which reported €0.86 per train-kilometre.

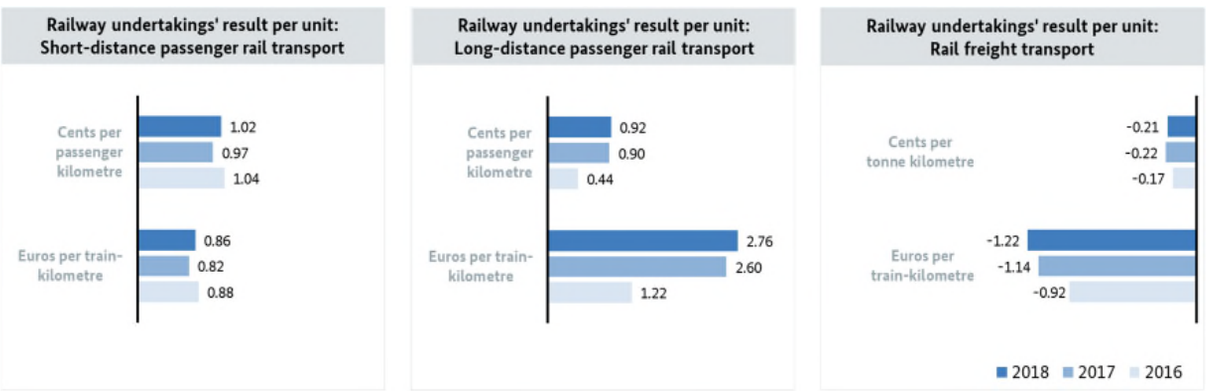


Figure 74: Operating results per passenger-kilometre and tonne-kilometre, broken down by type of transport service (2016-2018; in cents/euros)

In the rail freight transport segment, railway undertakings reported negative operating results – together with a downward trend – measured in terms of both train-kilometres and tonne-kilometres. By contrast, when non-federally owned undertakings are examined separately, this group of undertakings generated a positive operating result of 90 cents per train-kilometre and 0.12 cents per tonne-kilometre.

At 0.02 cents per passenger-kilometre and €0.01 per train-kilometre, non-federally-owned railway undertakings in the short-distance passenger rail transport segment posted positive operating results for the first time in a long time. This represents a marked improvement over the past two years.

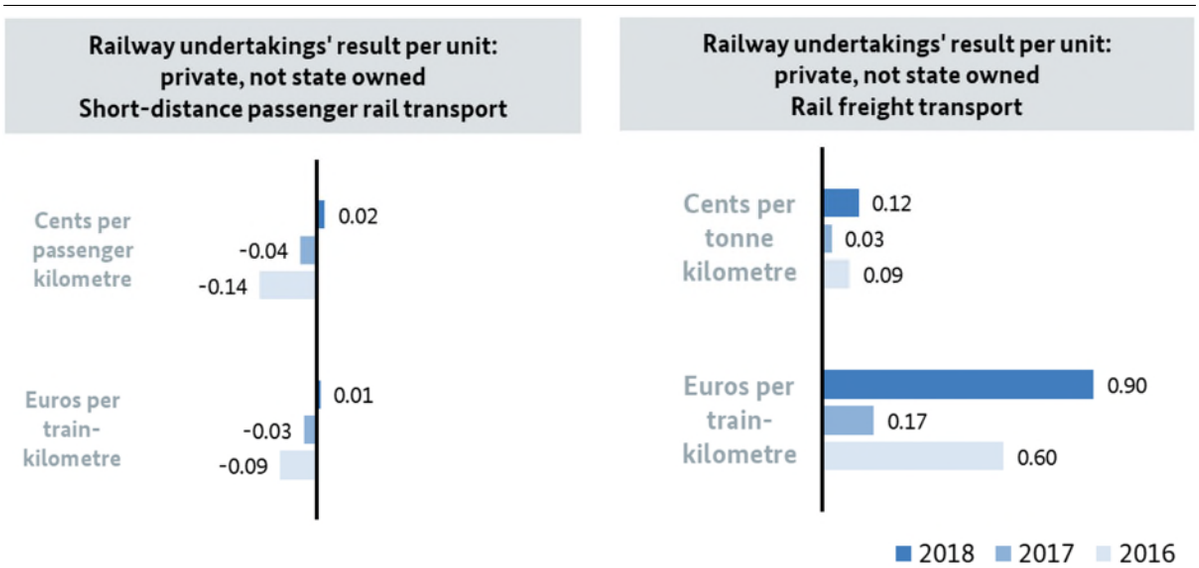


Figure 75: Operating results per passenger-kilometre and tonne-kilometre of non-federally owned railway undertakings in the short-distance passenger rail transport segment and the rail freight transport segment (2016-2018; in cents/euros)

Profit margin of the railway undertakings

The Bundesnetzagentur uses the enterprises' profit margin as the basis for calculating the economic efficiency of railway undertakings. Profit margin is calculated using the ratio of profit to revenue. It shows how much an enterprise actually earns, relative to its revenue.

The size of the railway undertakings' profit margin varied greatly between the individual transport segments.

Following a decline between 2016 and 2017, the profit margin in the short-distance passenger rail transport segment increased slightly. The profit margin in the long-distance passenger rail transport segment doubled in 2017 and increased slightly in 2018. The profit margin in the rail freight transport segment continues to be clearly in negative territory. The railway undertakings in this segment even reported an increase in their loss per euro of generated revenue compared to the previous year.

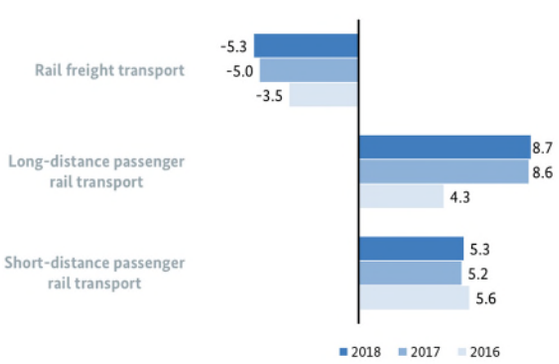


Figure 76: Railway undertakings' return on sales (2016-2018; in percent)

The profitability lead seen in the short-distance passenger rail transport segment was due primarily to federally owned enterprises. By contrast, non-federally owned enterprises generated on average a profit of 0.1 percent per euro of revenue.

A closer analysis of the rail freight transport segment reveals a contrast to the picture seen for passenger rail transport. Non-federally owned railway undertakings in the rail freight transport segment reported, as a whole, a positive profit margin of 5.5 percent in 2018. DB Cargo's lack of profitability however pulls the overall figure into negative territory. Its profitability was approximately -5 percent.

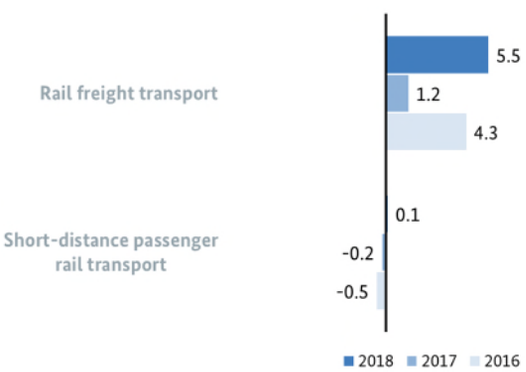


Figure 77: Return on sales of non-federally owned railway undertakings in the short-distance passenger rail transport segment and the rail freight transport segment (2016-2018; in percent)

Share of revenue represented by infrastructure costs

Placing infrastructure charges in relation to total revenue reveals marked differences between the individual types of service.

Infrastructure charges accounted for the largest share of revenue with 39 percent in the short-distance passenger rail transport segment which has reported moderate but steady growth over the years.

Very little change has been seen in the size of the share of infrastructure costs in the long-distance passenger rail transport segment in recent years. Following a slight decline in 2017, this share was approximately 25 percent, the same as in the preceding years.

The share of infrastructure costs in the rail freight transport segment has ranged between 17 and 18 percent since 2014. The burden that infrastructure costs place on railway undertakings was reduced by the track access charge assistance adopted by the federal government. As a result, the share of the infrastructure costs in the freight rail transport segment has fallen from 18 to 14 percent.

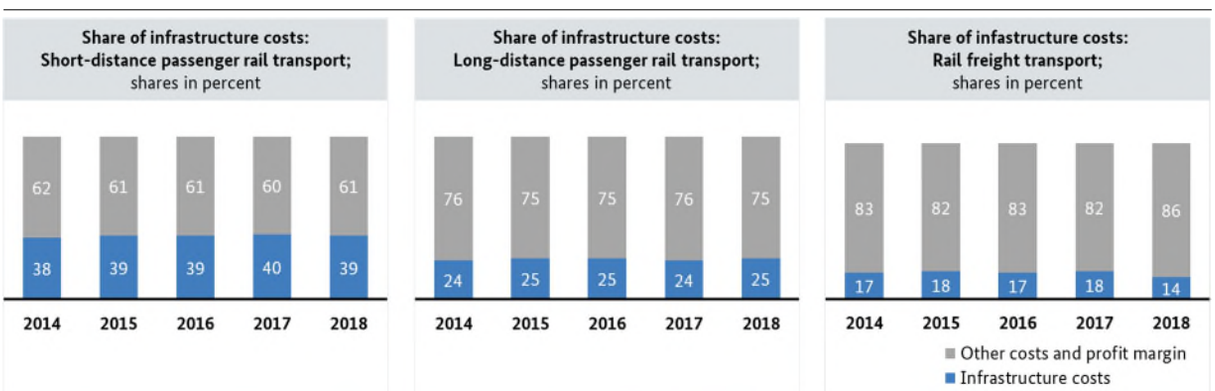


Figure 78: Share of infrastructure costs as a percentage of railway undertakings' revenue, broken down by type of transport (2014-2018; shares in percent)

A further breakdown of the infrastructure charges paid shows that track access charges constituted the largest share of the infrastructure costs. The largest share of the total infrastructure costs – 39 percent – are generally incurred in the short-distance passenger rail transport segment. Station charges accounted for approximately one-sixth of the infrastructure access charges paid by short-distance passenger rail transport services due to their greater use of stations. By contrast, this figure was only about 9 percent in the long-distance passenger rail transport segment.

More than one-fourth of the infrastructure charges for service facilities are paid in the rail freight transport segment. This is due first and foremost to this segment's use of marshalling yards, storage sidings and similar infrastructure and to the track access charge assistance. The charges for other service facilities were of secondary importance in the passenger rail transport segment.

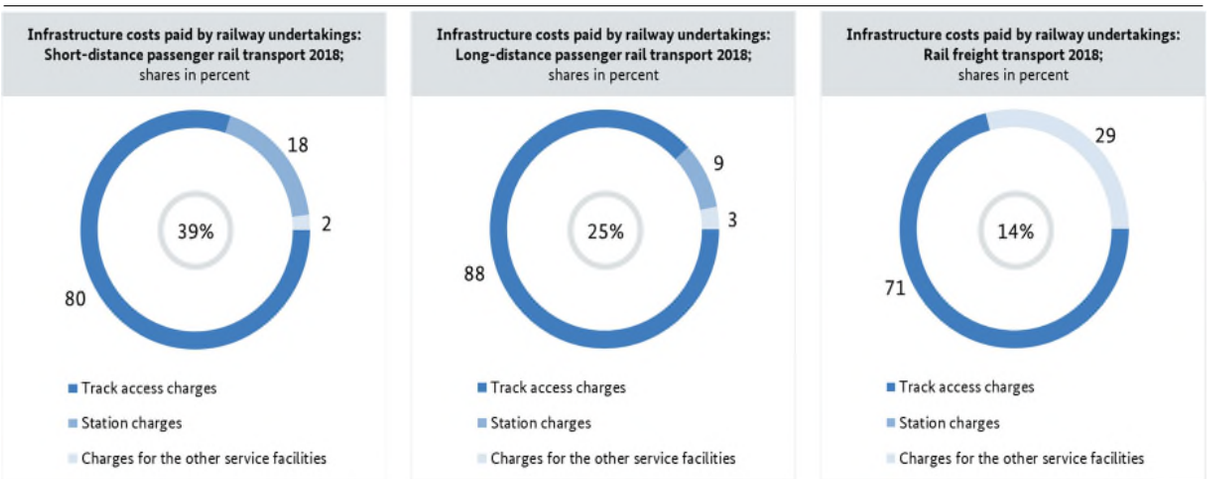


Figure 79: Breakdown of the railway undertakings' infrastructure costs (2018; shares in percent)

Results situation of non-federally owned infrastructure managers

As in the previous year, the managers of non-federally owned railway infrastructure continued overall to expend more on infrastructure than they generated through track access charges.

Short-distance passenger rail transport is the source of most – 82 percent – of the revenues generated from track access charges. Rail freight transport accounts for one-sixth of the revenues in this category.

At 35 percent, material expenditure was the largest block of expenses, followed by personnel costs (34 percent). Depreciation accounted for 16 percent of total expenditure. At 15 percent, the "other expenditure" category represents the smallest share of total expenditure.

Looking at financing, it was noted that at 29 percent, the average equity ratio of the non-federally-owned infrastructure managers was less than the overall market's average of approximately 37 percent.

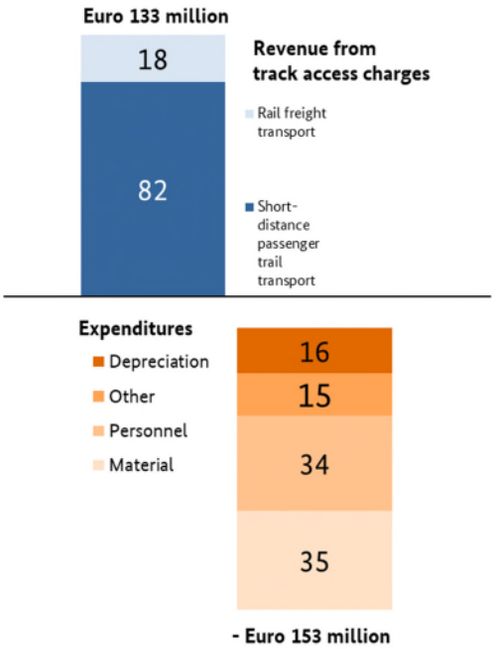


Figure 80: Revenues and expenditures of non-federally owned infrastructure managers (2018; shares in percent)

Results situation of non-federally owned service facility operators

The results situation of non-federally owned service facility operators improved markedly during the last business year.

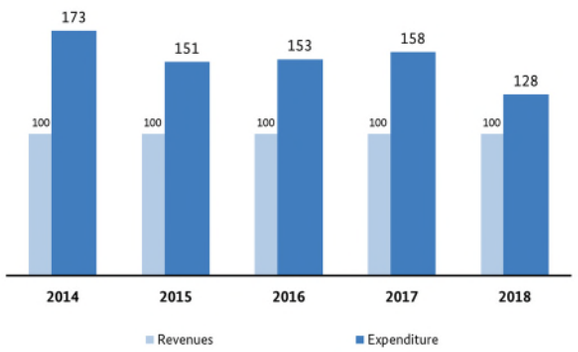


Figure 81: Development of revenue and expenditure of non-federally owned service facility operators (2014-2018; in percent)

Expenditure for maintenance, depreciation and the operation of service facilities continues to exceed the revenue generated from the charges for use of infrastructure. At 28 percent, the shortfall in 2018 was smaller than during the previous year when it reached 58 percent.

It can generally be assumed that the function of many non-federally owned service facilities is simply to support the respective company's primary business purpose, similarly to non-federally owned railway line infrastructure operators. Therefore, not every enterprise is geared to generating a profit. In many cases, railway operations do not constitute a core business activity for these enterprises. Consequently, any shortfalls are offset by other business units.

Financing of investments

In the 2018 reporting year, the railway line infrastructure operators surveyed said they had received nearly €3.6 billion in external funding to invest in existing infrastructure. They also reported spending €57 million of their own funds for this. All in all, somewhat more than €3.6 billion was invested in existing infrastructure. Federally owned infrastructure managers are required under the Service Level and Funding Agreement to contribute funds of their own to investments in existing infrastructure.

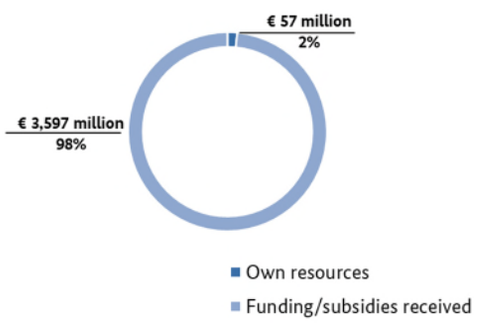


Figure 82: Investment in existing network infrastructure, broken down by own funds and external funding (2018; in millions of euros; shares in percent)

They invested €2.9 billion obtained through external funding and more than €0.6 billion of their own resources in the construction, modernisation or expansion of infrastructure.

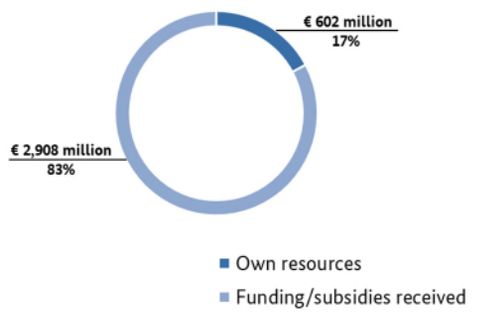


Figure 83: Modernisation and expansion of infrastructure, broken down by own funds and external funding (2018; in millions of euros; shares in percent)

At 83 percent, the external funding rate for the new construction, modernisation and expansion of infrastructure was lower than the external funding rate of 98 percent for investment in existing infrastructure.

The Federal Government provided more than €5 billion to subsidise investment measures in 2018. These funds represented 82 percent of total investment. Germany's federal states and local authorities provided a further 13 percent (somewhat more than €0.8 billion), while EU funding covered another five percent (approximately €0.3 billion).

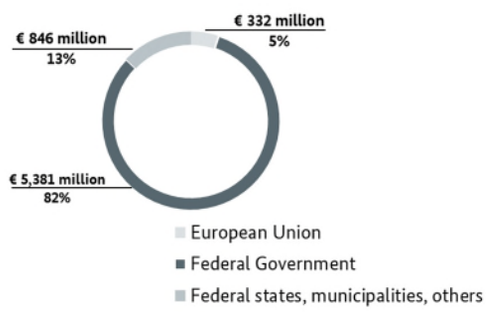
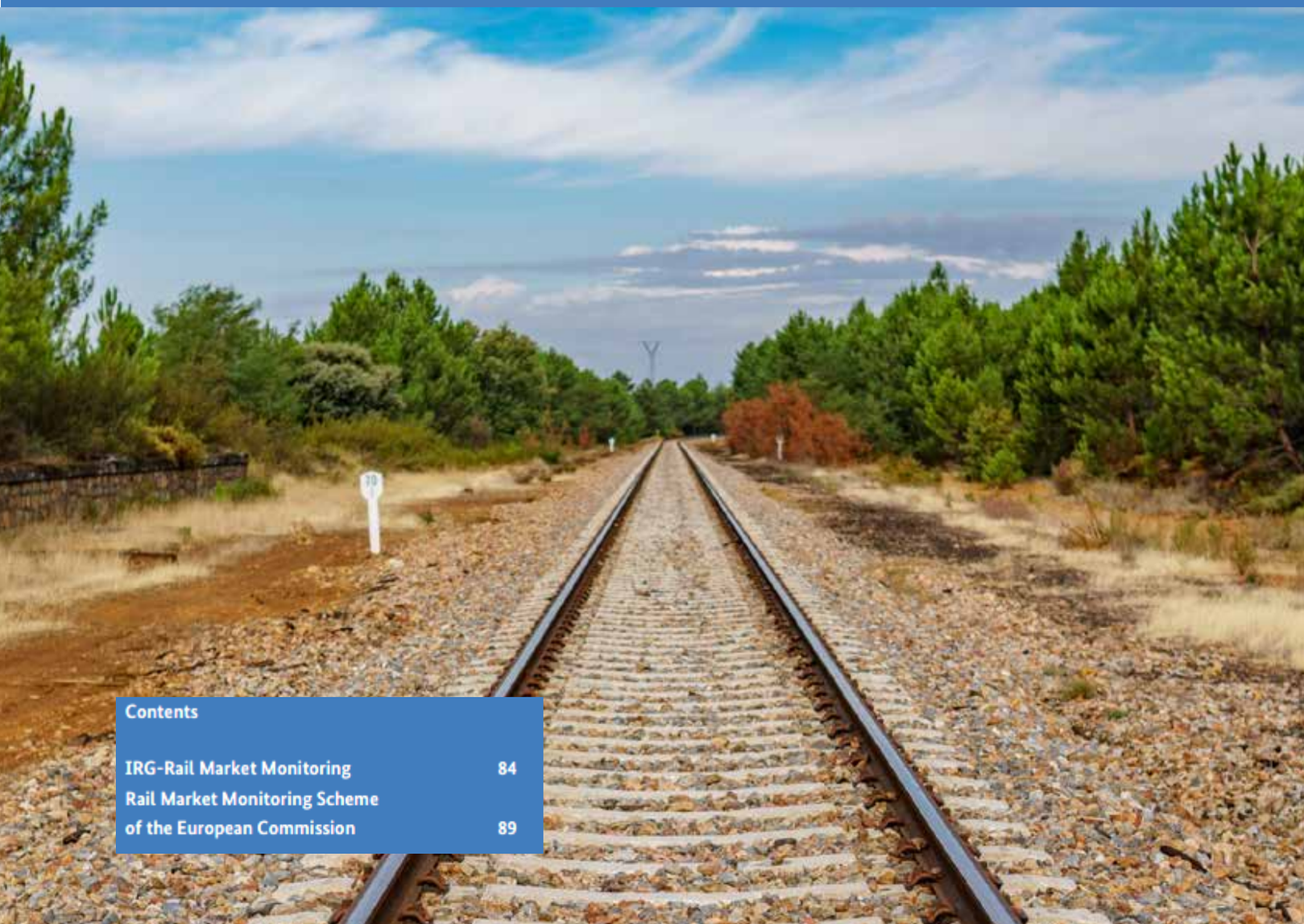


Figure 84: Funding sources of investment measures (2018; in millions of euros; shares in percent)

INTERNATIONAL MARKET MONITORING

IRG-Rail and the Rail Market Monitoring Scheme

Participation in international market monitoring activities and conducting an international market analysis have become firmly established in the railway segment. Since 2015, Member States have been required to provide data for the European Commission's Rail Market Monitoring Scheme.



Contents

International market monitoring

In 2017 the European railway market saw a further increase in the volume of transport services provided. Competitors grew their market shares in the freight transport segment in particular.

IRG-Rail Market Monitoring

The Independent Regulators' Group Rail (IRG-Rail), an alliance of independent regulatory authorities, has committed itself to driving the harmonisation of the European railway market forward and coordinating regulatory approaches.

The IRG-Rail Market Monitoring working group receives and processes the railway market data from all participating countries and presents them in an annual Market Monitoring Report. The analyses in these reports focus on the development of the competition and the transport services provided and on changes in the infrastructure.

This working group is chaired on a rotating basis. In 2018 it was chaired by the Italian regulatory authority.

The Bundesnetzagentur plays a key role in the working group; it consolidates the data from all participating countries, checks the plausibility of the data and then processes it. This work is based on a cross-border market data tool, which the working group developed.

Total route length per country in km

1	AT	Austria	5,648	15	LV	Latvia	2,217
2	BE	Belgium	3,605	16	LT	Lithuania	1,911
3	BG	Bulgaria	4,030	17	LU	Luxembourg	275
4	HR	Croatia	2,605	18	MK	FYR Macedonia	683
neu 5	CZ	Czech Republic	9,567	19	NL	Netherlands	3,055
6	DK	Denmark	2,560	20	NO	Norway	3,856
7	EE	Estonia	1,453	21	PL	Poland	19,251
8	FI	Finland	5,926	22	PT	Portugal	2,546
9	FR	France	28,747	23	RO	Romania	10,628
10	DE	Germany	39,219	24	SK	Slovakia	3,626
11	GR	Greece	2,240	25	SI	Slovenia	1,207
12	HU	Hungary	7,441	26	ES	Spain	15,356
13	IT	Italy	19,962	27	SE	Sweden	10,874
14	KO	Kosovo	437	28	CH	Switzerland	5,323
				29	UK	United Kingdom	16,320

Figure 85: Overview of participating countries and route lengths (2017; route length in km)

The 28 countries already participating in this working group were joined by the Czech Republic for the first time. As a result, the report now covers the entire Central European railway area. The participating countries account for a total route length of more than 230,000 kilometres. Germany, France, Italy, Poland, Great Britain and Spain operate the longest railway networks with route lengths of more than 15,000 kilometres each. Together they represent approximately 60 percent of the European route network.

Europe-wide, the electrified share of the network is 55 percent. This figure is 53 percent for Germany when the DB AG rail network and the networks of non-federally owned railways are taken into account. The rankings are topped by the Benelux countries and Switzerland with electrification rates ranging between 75 and 100 percent. By contrast, between 88 and 92 percent of the railway network in the three Baltic states is not electrified.

The ownership structure in the European railway network remains unchanged, with 93 percent of the network in the hands of former state-owned railways. In 15 countries, a single infrastructure company operates the respective country's entire railway infrastructure. In the other 14 countries, the share of railway networks which are operated by more than one infrastructure manager ranges between one and 42 percent. In Germany, DB AG operates approximately 85 percent of the railway network, while the remaining 15 percent – around 5,600 kilometres – is split between more than 100 non-federally owned infrastructure managers.

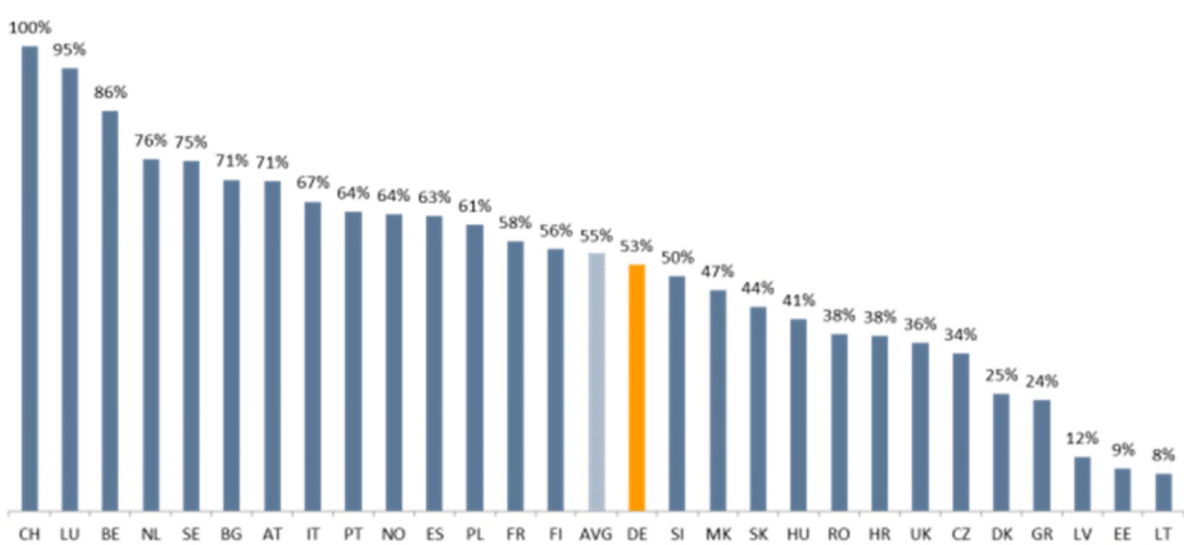


Figure 86: Electrified route length (2017; shares in percent)

A total of 4.5 billion train-kilometres were travelled in the European railway network in 2017, with rail freight transport accounting for 19 percent of this amount and passenger rail transport for the remaining 81 percent. The rail freight segment provided 448 billion tonne-kilometres in transport services, while the passenger rail transport segment provided 474 billion passenger-kilometres. Both figures represent a marked increase over the previous year.

The track access charge per train-kilometre for the minimum access package averaged €4.10 for all rail transport services in the countries examined. The average charge was €4.36 for passenger rail transport services and €2.94 for rail freight transport, with the passenger segment accounting for 87 percent of the total and the freight segment the remaining 13 percent. Looking at the individual countries, prices range from just a few cents at one end of the spectrum, to a large bloc of more than ten countries in the middle with prices between €1 and €3 per train-kilometre, to a dozen countries at the other end of the spectrum with prices of more than €4 to around €13 per train-kilometre. Compared to the last five years, track access charges in the passenger rail transport segment have steadily increased. After declining for four years in a row, charges in the rail freight transport segment have begun to rise throughout Europe.

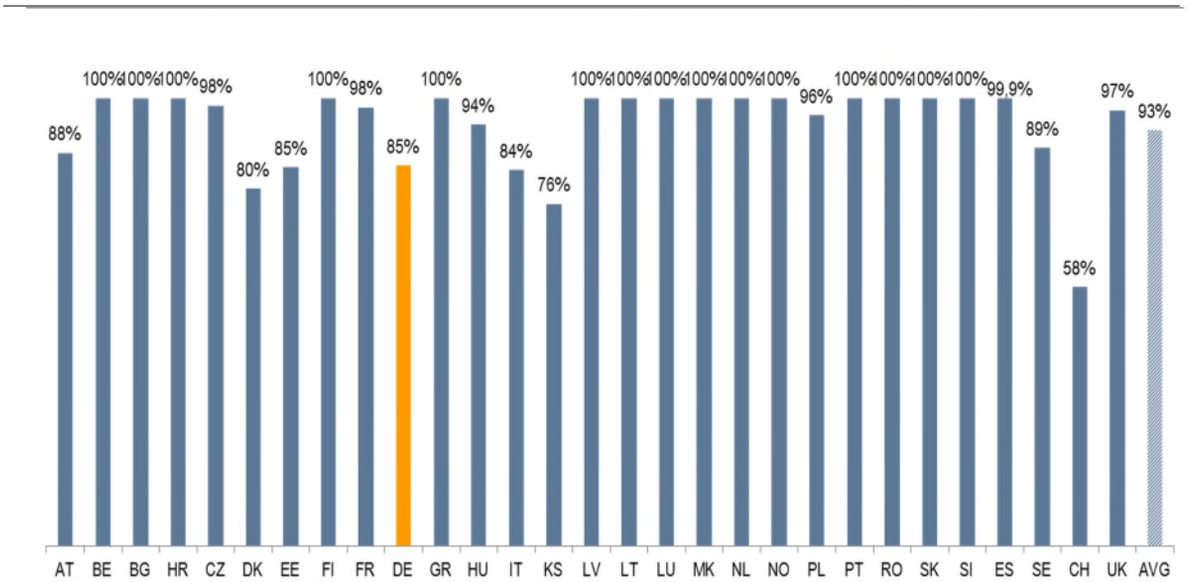


Figure 87: Dominant undertakings' share of route length (2017; shares in percent)

The share of the rail freight transport segment held by former state-owned railways continued to decline in 2017. Both private undertakings and subsidiaries of foreign state-owned railways grew their respective market share in equal measure. Based on the participating countries, the share of the rail freight transport market held by competitors averaged 41 percent in 2017. The competitors' share of the total passenger rail transport market remained stable at 24 percent. In this segment, the subsidiaries of foreign state-owned railways in particular took market share from the other private competitors in 2017.

IRG Rail publishes its annual report on the internet.

The Seventh IRG-Rail Market Monitoring Report for the 2017 reporting year can be downloaded from the following address:

https://www.irg-rail.eu/irg/documents/market-monitoring/220,2019.html

The Eighth IRG-Rail Market Monitoring report with statistics for 2018 is scheduled to be released on the above website in the first quarter of 2020.

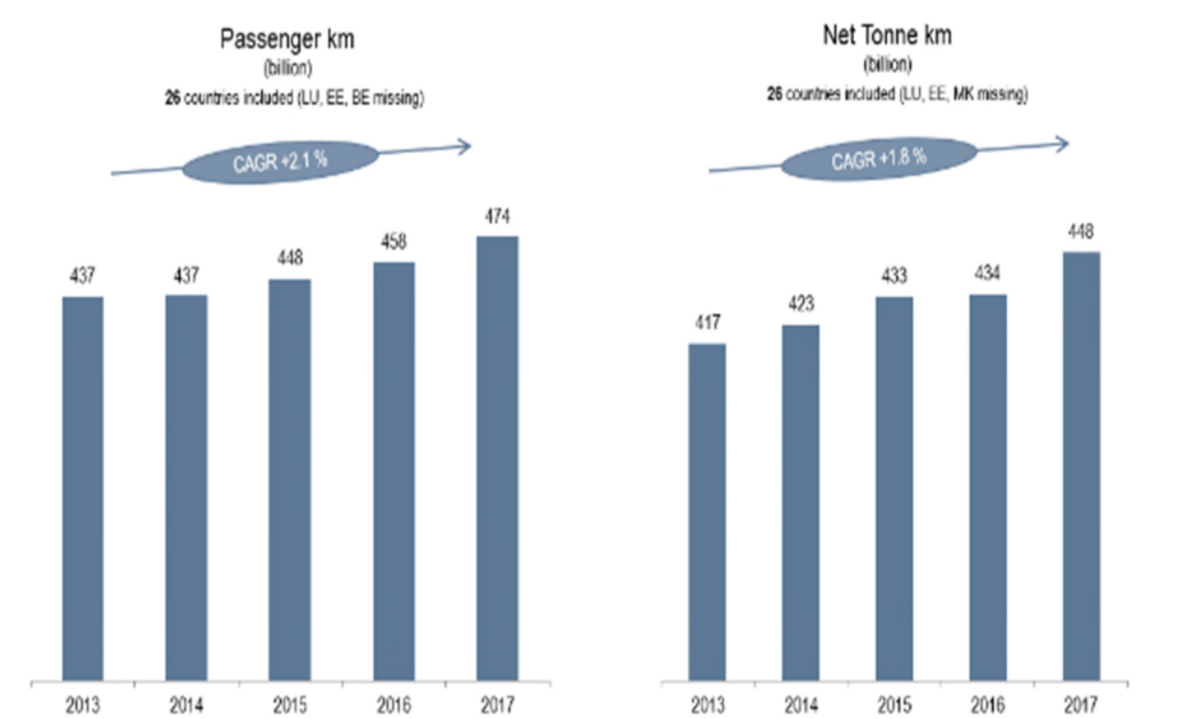


Figure 88: Development of rail transport services (2013-2017, in billions of passenger-kilometres or net tonne-kilometres)

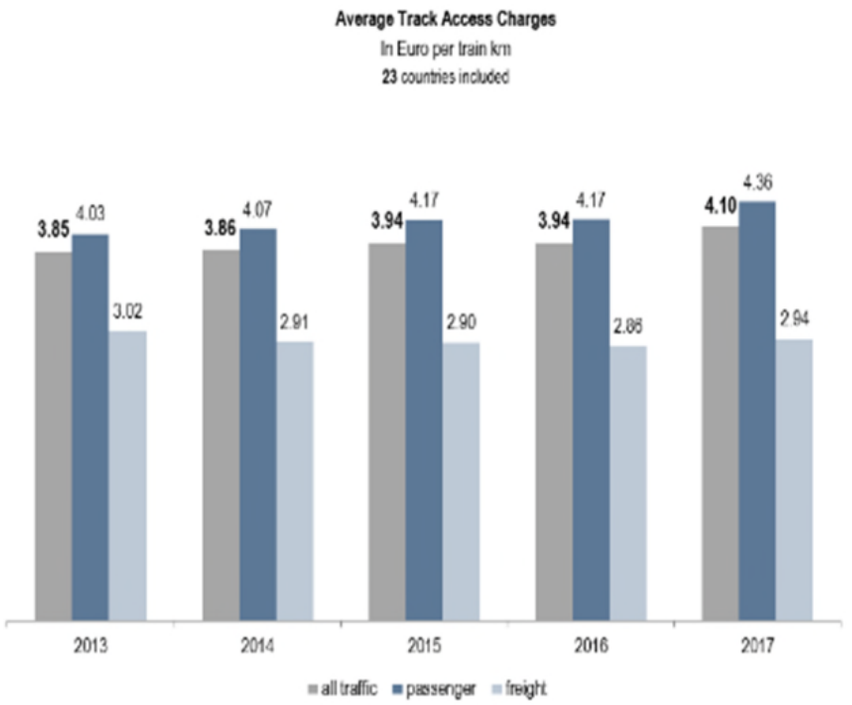


Figure 89: Development of average track access charges in the passenger and rail traffic (2013-2017)

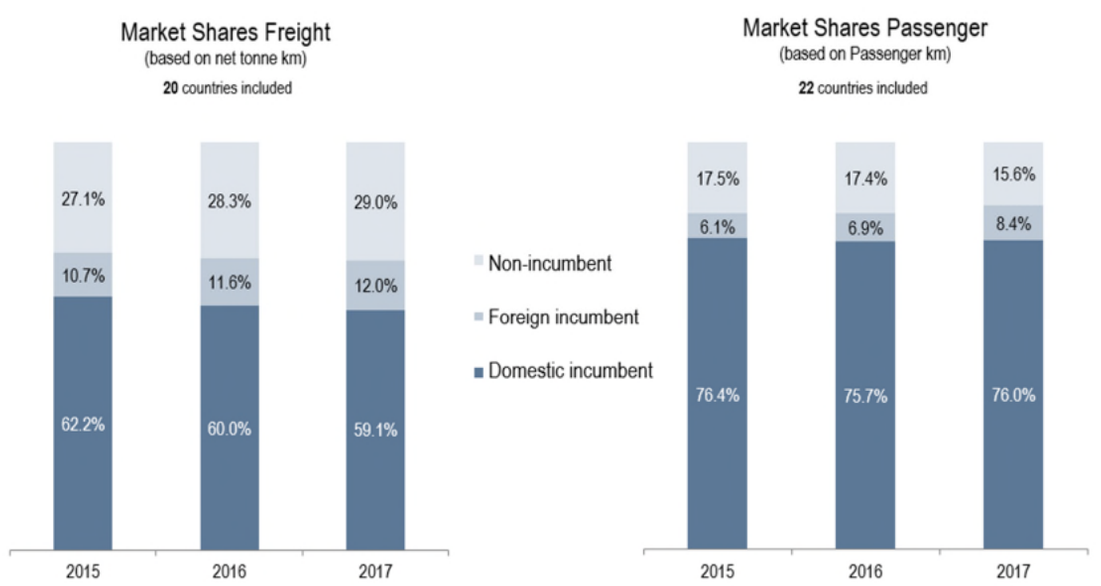


Figure 90: Market shares for passenger rail transport and rail freight transport (2015-2017; shares in percent)

Rail Market Monitoring Scheme of the European Commission

Pursuant to Article 15, paragraph 4 of Directive 2012/34/EU, the European Commission is required to prepare and submit a report on the rail transport market in Europe every two years to the European Parliament.

These reports examine the state of the railway network in the European Union as per the above-mentioned Directive, as well as the evolution of the internal market for rail services and service quality. They also map out the evolution of framework conditions such as trends in infrastructure charging, capacity allocation and infrastructure restrictions, infrastructure expenditure and financing, plus price development, the quality of passenger rail transport services, the development of employment, and social conditions.

The European Commission issued Implementing Regulation (EU) 2015/1100 in July 2015. This Regulation requires Member States to provide the European Commission specific information regarding the development of the railway markets. This is done as part of the Rail Market Monitoring Scheme (RMMS).

Since 2016, the Member States have had the option of delivering data to the European Commission using a data portal. This data portal has been optimised in the years since then. As a result, cross-country comparisons of individual data can now also be conducted.

The European Commission's sixth Report on monitoring development of the rail market was published in February 2019. This report also draws on statistics from various sources and publications such as the Statistical Pocketbook "EU Transport in Figures" and reports issued by the European Union Agency for Railways (ERA) and Eurostat.

The total length of the railway network in the European Union was approximately 221,000 kilometres in 2016. This represents a decrease of a little more than one percent compared to 2011.

The passenger rail transport segment grew by 1.7 percent a year during the years from 2009 to 2016. Cross-border traffic accounted for six percent of total passenger rail traffic volume in 2016. Between 2007 and 2016 the passenger rail transport segment's modal share in land transport increased from seven to 7.6 percent. Looking at modal share in the land freight transport segment, the rail share of EU land freight transport was 17 percent in 2016, down from 19 percent in 2011.

Based on the Member States' reports to the European Commission, in 2016 there were: 31,000 passenger stations, more than 2,300 freight terminals, more than 400 marshalling yards, more than 1,600 maintenance facilities, more than 700 maritime and port facilities, and more than 950 refuelling facilities.

Track access charges accounted for more than 80 percent of infrastructure managers' revenues from charges in the majority of countries. At €19 per train kilometre, track access charges for high-speed transport were the highest.

The most intensively used rail networks are those in north-west Europe. Network utilisation rates in the Netherlands, the United Kingdom, Austria, Denmark, Luxembourg, Germany and Belgium are some 70 percent higher than the EU average. The total length of track declared congested was approximately 3,000 kilometres in 2016, including 1,000 kilometres of rail freight corridors. Germany, Italy and Romania have each declared more than 100 kilometres of track in their respective network to be congested. Transport services that are provided under public service obligation have top priority in 11 Member States.

Infrastructure expenditure fell by €3.5 billion, from €50 billion in 2015 to €46.5 billion in 2016. According to the European Commission's report, maintenance and renewal expenditure totalled €26 billion in 2016. The funding the infrastructure managers receive for maintaining and improving their rail infrastructure comes from a variety of sources. Seventy percent of these funds come from national budgets.

An average of 90 percent of the trains operating in the local and regional passenger rail service segments were punctual. Most of the Member States reported that domestic rail freight service is more punctual than international rail freight service.

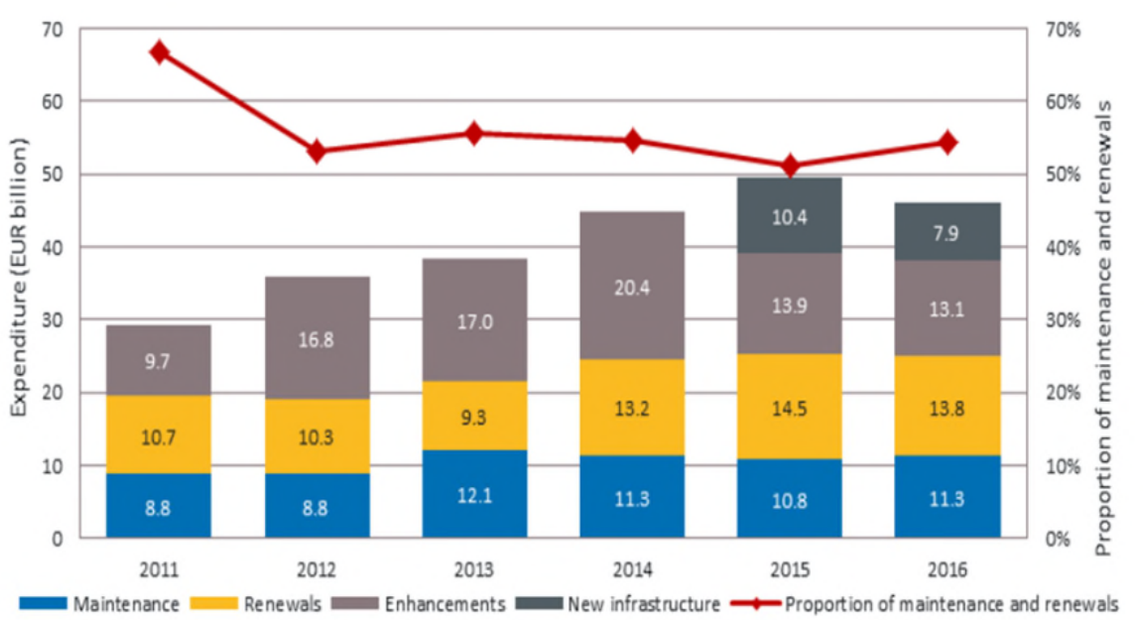


Figure 91: Infrastructure expenditure and share of expenditure on maintenance and renewals (2011-2016; shares in percent and expenditure in euros; source: RMMS)

Railways continue to be a safe mode of transport. There were 964 rail fatalities in Europe in 2016. Most of the accidents in the railway transport segment involved people using level crossings. From 2011 to 2015, rail travel was 25 times safer than travelling by car.

In 2016, services provided under a public service contract accounted for more than 60 percent of total rail passenger-kilometres. In the majority of EU Member States, public service obligation compensation constitutes an important source of revenue for railway undertakings. Competitive tendering was used for 41 percent of all services offered in 2016. Competitive tendering for public service obligation (PSO) services was particularly used in the liberalised markets of the United Kingdom, Germany and Sweden. With the adoption of the Fourth Railway Package, the use of competitive tendering will increase in the future and transport contracts will be awarded directly only in exceptional cases. The total volume awarded through new competitive tenders was more than 32 million train-kilometres in 2016.

The picture of PSO compensation per train kilometre and the revenue generated through passenger fares varies from Member State to Member State. In the United Kingdom, average PSO compensation is negative. This is because bidders for exclusive rights under PSO contracts (“franchises”) might pay a "premium" if, in their view, the services can be operated profitably based on the current (regulated) levels of access charges and fares.

In 2016, the number of active licences for railway undertakings ranged from 448 in Germany to two undertakings in Luxembourg and Ireland. The same year, the average fee for issuing a licence ranged from €10 in Croatia to €37,500 in Portugal.

The market share held by competitors relative to the sum of all EU countries increased between 2011 and 2016. In Sweden and Estonia, competitors lost market share.

According to data from the Member States, railway undertakings employed approximately 600,000 persons and infrastructure managers employed 440,000 persons at the end of 2016. Most of the employees in the railway sector are men. The share of female employees averages only 21 percent. In Spain, Greece and Italy, more than 50 percent of the workers were over 50 years old in 2016. At least 90 percent have a permanent employment contract. Eighty percent of the staff are employed full time.

This report is available in several languages free of charge at:

https://ec.europa.eu/transport/modes/rail/news/2019-02-06-commission-adopts-report-development-rail-market_en

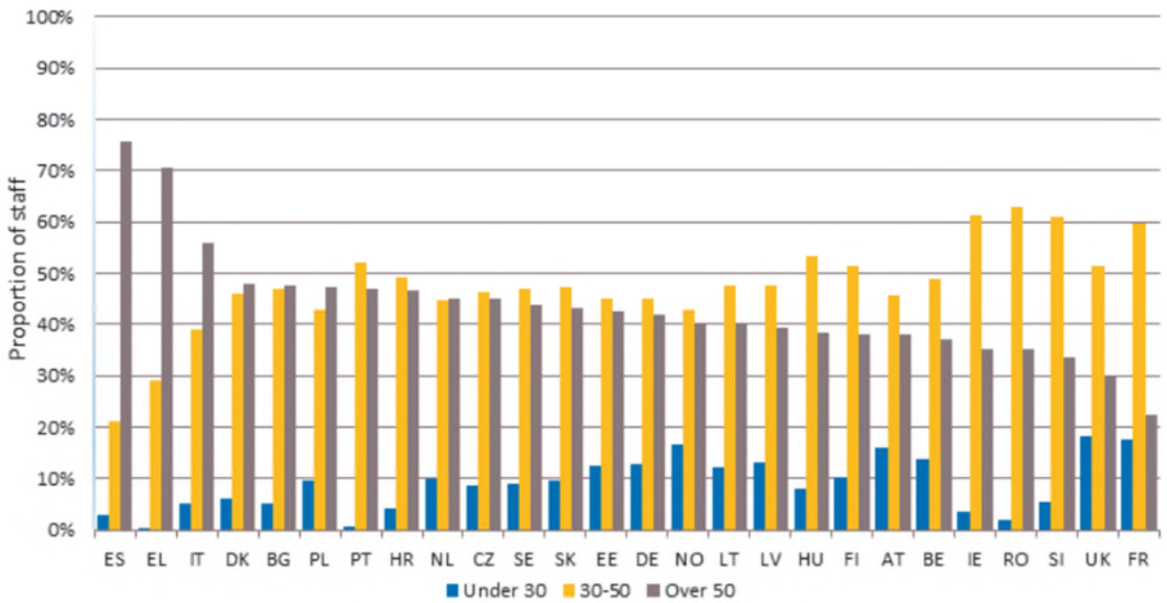


Figure 92: Employees by age group and country (2016; shares in percent, source: RMMS)

ANNEX

Annex

Method used for rating influencing factors

The chapters “Ratings for access to railway infrastructure” and “Ratings for and development of pricing systems” outline the views of railway undertakings and regional transport authorities regarding key factors that influence the railway market.

The findings outlined in these chapters are based on the feedback that railway undertakings and regional transport authorities responsible for short-distance passenger rail transport service provided for the annual market survey. As part of this survey market players are asked to rate issues relating to access and non-discrimination. The scale used for these ratings ranged from “1 – Excellent, no need for action” to “5 – Inadequate, urgent action necessary”. Even though this part of the questionnaire was optional for the respondents, many of the railway undertakings offered their assessment of the current market situation. The published results therefore reflect the market situation and can thus be regarded as representative. In particular, the order of similar indicators in the ratings reveals the areas where railway undertakings see the most problems.

Since the railway undertakings usually assess the market from their point of view at the time of the survey, these findings on the ranking of influencing factors – unlike the other data for the reporting year – refer to the year in which the Bundesnetzagentur conducted the survey (2019).

List of figures

List of abbreviations

AEG	General Railway Act
AG	Stock Company
bn	Billion
DB AG	Deutsche Bahn AG
EBA	Federal German railway authority
ERA	European Union Agency for Railways
ERegG	Railway Regulation Act
EU	European Union
GDP	Gross domestic product
GmbH	Limited Liability Company
IM	Infrastructure manager
IRG-Rail	Independent Regulator's Group-Rail
km	Kilometre
m	Million
NVR	National Vehicle Register
ÖBB	Austrian Federal Railways
Pkm	Passenger-kilometre
PSO	Public service obligation
RLIO	Railway line infrastructure operator
RMMS	Rail Market Monitoring Scheme (market monitoring at European level)
RU	Railway undertaking
t	Tonne

tkm	Tonne-kilometre
Trkm	Train-kilometre
VKM	Vehicle keeper marking

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Editor

Bundesnetzagentur für Elektrizität, Gas, Telekommunikation, Post und Eisenbahnen

Tulpenfeld 4

53113 Bonn

Responsible for content | Contact

Dr Axel Müller

Tulpenfeld 4

53113 Bonn

axel.mueller@bnetza.de

www.bundesnetzagentur.de

Tel. +49 228 14-7020

Fax +49 228 14-6700

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